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N. J. LOGIE, M.B. ABERD., F.R.C.S. — R. S. HANDLEY, M.B. CAMB., F.R.C.S.
MAJORS R.A.M.C.

THIS article was inspired by a remark made by a medical officer that R.A.M.C. personnel working in forward and line-of-communication areas were anxious to know the results of their treatment. Between us we have seen almost 700 British and Italian casualties, men wounded in every region of the body, including many injured 5–9 days before admission, and we have tried to assess the value of varying types of treatment. Working under conditions of extreme difficulty, and faced with problems of transport, supply, terrain and climate uncommon in other theatres of war, the medical officers in forward areas have achieved results which were admirable for the most part, as judged by the condition of the wounded on arrival at the base. In certain cases, however, the measures adopted were less successful, and it is from such that valuable lessons may be learned, lessons which emphasise that the canons of surgery can seldom be flouted with impunity. By selecting these cases we may apparently present a distorted review, but we have concentrated on the less successful results because error rather than success is the great teacher. Incidentally, medical officers would gain much useful information about the results of their treatment if they made more use of the official follow-up cards which are available.

FLESH WOUNDS

Every case admitted had wounds of the soft tissues of varying severity, and many also suffered from damage to other structures. The less serious cases had had no treatment except one or more dressings, the favourite local applications being sulphanilamide and acriflavine, while all except a small minority had received prophylactic doses of antitetanic serum. Anti-gas-gangrene serum was seldom employed.

The majority of the more serious wounds had been subjected to débridement or complete excision, and the resulting cavities had been treated with sulphanilamide. Thereafter the procedure varied. Most of the wounds were left open, but sometimes suture was attempted, sometimes the cavity was packed with plain gauze, and a few had been packed and partially sutured, an attempted compromise between open and closed treatments which usually failed. Undoubtedly the wounds which were left open did best. Examples of successful primary sutures were rare, nearly all having become septic, so that the stitches had to be removed after arrival at the base. The failures were due to incomplete or too late excision of damaged tissues, the presence of foreign bodies, tight suturing, insufficient drainage, or lack of rest; the liberal use of sulphanilamide did not neutralise the neglect of these cardinal points. Loose packs produced no ill results, and may have helped to keep the sulphanilamide in contact with the wound surfaces. Tight packing was encountered several times, mainly in wounds of the extremities, and usually with deplorable results. Pain was excessive, the wounds were septic, the general condition was often poor, and there was the added disadvantage that removal was often impossible without an anæsthetic.

The question of drainage is a difficult one, and is closely related to the procedure adopted after cleansing the wound, but we believe that certain primary sutures would have succeeded had a separate drainage incision been made in the most dependent position, through which a jaconette or rubber drain could have been inserted. Drainage-tubes were seldom employed, and counter-incisions were conspicuous by their absence—not a surprising fact, for an infected area requiring such incisions on reaching the base may well have had adequate drainage through the original wound when last treated. It was found that gauze packing was worse than useless as a method of draining sutured wounds on account of coagulation of the enmeshed exudate; well-vaselined gauze strips are more effective as drains than dry gauze, provided the suturing is not too tight.

A number of attempts had been made in forward areas to remove foreign bodies before radiography was possible, and a high proportion of these operations were failures. Therefore unless a foreign body can be seen or felt, or is producing severe symptoms, it is unwise to attempt its removal until accurate localisation has been effected, and foolish to do a primary suture after such an operation unless all corners of the wound have been inspected. This is especially true in areas where the presence of important structures or large muscular masses renders exploration difficult or dangerous.

When there are extensive or multiple wounds the advantages of splinting might be considered more often; and if tendons or nerves are severed the limb should be maintained by splints in the position most favourable for repair. This important principle of surgery was neglected in several cases, and employed with excellent results in others.

HÆMORRHAGE

We have mentioned that tight packing of wounds produced deplorable results. Such packs were doubtless inserted to procure hæmostasis, and if the journey between the various medical stations is short no harm may result, but when days may elapse between insertion and removal this method should be avoided.

Realising the difficulties of searching for a divided vessel when working in unfavourable surroundings, perhaps with inadequate instruments and defective lighting, we suggest that if a bleeding point cannot be secured and tight packing is used as a last resort, then the fact should be prominently noted in the field medical card, so that the packing can be removed at the first place where reasonable surgical facilities exist. In palmar wounds, where prolonged packing is particularly undesirable, the relative safety of arresting hæmorrhage by a palmar pad and a firm bandage over the clenched fist is worth remembering. The bandage can be slackened and readjusted by an orderly whenever necessary, whereas the pressure of a pack cannot be eased so simply. Incidentally the search for bleeding points would be greatly facilitated if small self-retaining retractors were included in surgical haversacks and operating sets.

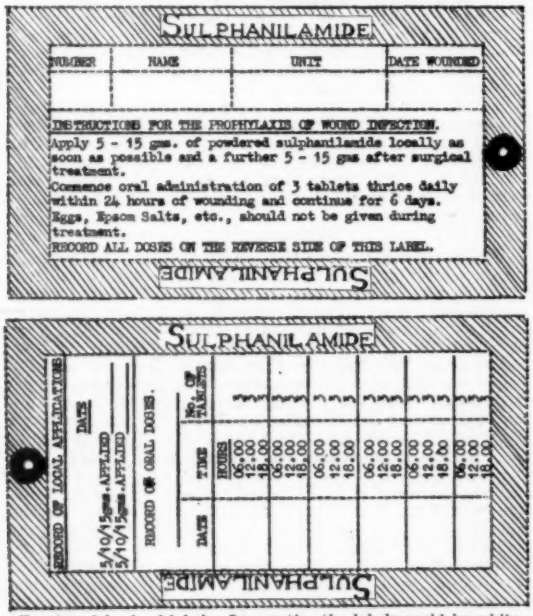
No cases were admitted wearing tourniquets, but a few arrived in whom layer after layer of bandages had been firmly applied to a limb to control hæmorrhage. These had become saturated with dried blood, and formed a rigid case constricting the limb, producing severe pain locally and œdema of the parts distally. If exploration and direct control of bleeding is impossible, then the lesser of two evils is the use of a pack rather than layers of bandages.

Severe grades of anæmia were uncommon, but several patients would have benefited from blood or plasma transfusions before being sent down the line.

CHEMOTHERAPY

Chemotherapy was used frequently, sulphanilamide or sulphapyridine being given by mouth, applied locally to the wound, or the two methods were combined. The dosage given by mouth varied considerably, and the regularity of administration fluctuated as the patient passed from stage to stage of the journey. Calculations made from field medical cards and other documents showed that the amounts given were usually between 1 and 4 g. daily—seldom more, and often less. From a study of the condition of the cases on arrival at the base we are convinced that those who received the larger doses of the drug showed less local sepsis and had fewer complications, and we therefore believe that larger doses should be given by mouth as a routine, and that local applications of sulphanilamide are also advisable because they provide a greater concentration of the drug in the vicinity of the infecting organisms. Oral administration should never be omitted, because local applications may be washed out of the wound if the discharge is profuse, or the drug may all be absorbed and excreted within 60 hours.

After careful consideration of many cases we are in agreement with our colleague Major G. A. H. Buttle that the present dosage recommended in official memoranda for the prophylaxis of wound infection is inadequate, and we suggest that all wounds should be dusted with finely powdered sulphanilamide as soon as possible after wounding. The amount to be used must obviously depend on the size or number of the wounds, but the total applied should not exceed 15 g. at one time. A further local application of a similar amount should be made in all severe injuries when surgical cleansing of the wounds is undertaken. Such applications would be greatly facilitated if medical officers and units were


SULPHANILAMIDE
NUMBER
NAME
UNIT
DATE WOUNDED
INSTRUCTIONS FOR THE PROPHYLAXIS OF WOUND INFECTION.
Apply 5 - 15 gms. of powdered sulphanilamide locally as soon as possible and a further 5 - 15 gms after surgical treatment.
Commence oral administration of 3 tablets thrice daily within 24 hours of wounding and continue for 6 days.
Eggs, Epsom Salts, etc., should not be given during treatment.
RECORD ALL DOSES ON THE REVERSE SIDE OF THIS LABEL.
SULPHANILAMIDE
SULPHANILAMIDE
RECORD OF LOCAL APPLICATIONS
DATE
5/10/41 gms. APPLIED
5/10/41 gms. APPLIED
RECORD OF ORAL DOSES.
DATE
TIME
HOURS
06.00
12.00
18.00
No. OF TABLETS
SULPHANILAMIDE

Front and back of label. In practice the labels could be white with a red border.

provided with Cellophane packets or tubes each containing 5 g. of finely powdered sterile sulphanilamide. These packets might actually be enclosed in the first field dressing. Oral administration consisting of three tablets (1·5 g.) thrice daily should begin as soon as possible, and certainly within 24 hours of the occurrence of the casualty, and should be continued for 6 days. The dates, times and the dosages given should be carefully recorded in the field medical cards. In practice, as we have said, the doses were given sporadically, and in order to ensure regularity a characteristic label might be provided which could be attached in a conspicuous position to men selected by medical officers for chemotherapy. Thereafter wherever the man might go and by whatever method of transport, the fact would be patent that he was receiving sulphanilamide, and an orderly could go round at stated times with a supply of the drug, give three tablets to each man wearing the label, and at the same time record the fact by marking the card with an X in the appropriate place. It is simple to devise a printed label which reduces writing to an absolute minimum (see figure).

If serious infection supervenes, or if the wound is already infected when the man is first seen, then larger doses are required, for example five or six tablets every 6 hours (10–12 g. daily) for the first 2 days, the dose being gradually reduced as the condition improves. Such doses were never given before admission even in severe cases. Should gas-gangrene develop or be suspected, sulphapyridine should be given instead of sulphanilamide, because although both act against *Clostridium welchii* the former is slightly more active against the *Cl. septique*. These larger doses are potentially dangerous if continued for more than 7–10 days, but by that time the patient would have reached a unit where a blood examination could be performed. Apart from minor degrees of cyanosis no soldier was admitted who had suffered from chemotherapy; a number may have suffered from the lack of it. It is interesting to record that we have twice found that complications due to hæmolytic streptococcal infection can develop in patients receiving 8 g. of sulphanilamide daily.

As regards local applications, sulphanilamide apparently produced better results than such antiseptics as eusol, acriflavine or hydrogen peroxide, and this was particularly noticeable in cases where the dressings had not been changed for 3 days or more. Under such conditions those treated with the usual antiseptics were often heavily infected, whereas those dressed with sulphanilamide were often surprisingly clean. Those wounds which had not responded so well to sulphanilamide were found to be infected with staphylococci—usually *Staphylococcus aureus*.

Whether or not the best method of applying the drug locally has yet been found is questionable. Application to deep or complicated cavities is always difficult, for example to the knee-joint, or to large wounds made by modern missiles where the underlying damage is often so much more extensive than the size of the superficial wound would lead one to expect. In cases arriving at the base it was found that in superficial wounds the powder was more adherent to the dressings than to the raw surface and was removed with the soiled dressings, while in many cases it was apparent that incompletely crushed tablets had been used both for surface application and for insertion into cavities. Thus in cases with deep wounds irregular masses were found to be extruding from the cavities, and sulphanilamide in this lumpy state can scarcely be expected to exert its maximum effect.

In coöperation with Major Buttle we have been experimenting with various methods which could be employed in forward and line-of-communication areas. For example, in surface wounds it may be used as a fine powder applied evenly under a Vaseline spread (in our opinion the best method); as an ointment (5 g. sulphanilamide to 1 oz. vaseline) applied directly to the wound or spread on gauze or lint; in the form of a solution containing 5% sulphanilamide, 20% dextrose and 4% sodium bicarbonate, in which the dressings may be soaked, or which may be sprayed on the wound, left for 10–15 min., and then covered by a vaseline spread; this last method produces a thin adherent film of the drug over the entire wound area. For deep cavities and complicated spaces a solution containing 5–8% sulphanilamide in 80–100% glycerin provides an easy method of introducing the drug to every recess, and it also makes an almost non-adherent dressing for more superficial wounds.

FRACTURES

Very few fractures have been missed. All others had been treated in orthodox ways, and the great majority arrived in excellent general condition. Most of the fractures were compound and comminuted, and many were complicated by involvement of joints, vessels or nerves. Nearly all these had been operated on and fixed in wooden, wire or improvised splints, in plaster, or, in the case of fractured femora, in Thomas splints. The few who arrived in poor condition had other injuries, usually visceral, or their wounds had become heavily infected.

The results being generally so effective, we have little to offer in the way of constructive criticism. Plaster-of-paris, the best form of support for most limb fractures, might have been used more often, and when it was employed the casings were sometimes too short or too thin for adequate support, although this may have been due to a scarcity of plaster in the forward areas. The use of plaster slabs was not sufficiently appreciated. These can be held in position by a few circular turns of a plaster bandage, the result being a case very thick and strong in one part to give adequate support, and so thin elsewhere that it may be cut with ordinary scissors if the need arises (actually we saw no instance of damage from too tight a plaster). Plaster splints composed entirely of circular turns are less strong, weight for weight, than those employing the girder principle, and their uniform thickness precludes their easy removal without special instruments. The slab method, therefore, not only saves plaster but also possesses definite

advantages over the circular method of application. When removal of the case is likely to be required within 2–3 weeks, vaseline smeared over the skin prevents adhesion of the plaster to the hairs, thus avoiding what we found to be a common cause of pain and inconvenience. In addition, if an open infected fracture exists, vaseline helps to protect the skin from secondary infection.

Men with fractured femors had their injured limbs fixed in Thomas splints, but extension was usually omitted. No spring boot-clips were in evidence, and we conclude they are not available ; the alternative clove-hitch and windlass method was only seen once. The limbs were well fixed, so no great shock had resulted, but nevertheless extension is desirable, though heavy traction is not required to enhance the efficiency of the fixation. Cases have been reported where a tightly applied clove-hitch had caused sloughing, and during the long journey from the desert front this would have been very liable to happen. Some such thought may have been in the minds of the medical officers who neglected this method of extension. The rings of the splints often bore no relationship to the size of the thigh, and the provision of splints with adjustable rings or detachable rings of varying sizes would be a useful addition to the medical equipment. Colonel D. C. Monro, consulting surgeon to the M.E.F., has suggested that in fractures of the lower limb the use of posterior plaster slabs, with plaster bandage ties incorporating the side bars of a Thomas splint, would give better fixation than the splint used alone. In two cases where we saw this method employed—one an officer with a compound fracture of the femoral condyles and the other a sergeant-pilot suffering from a fracture-dislocation of a knee—the results were excellent, and the method deserves wide adoption.

Those with fractures in the region of the knee-joint, or of the leg bones, were more comfortable in plaster cases than in Thomas splints alone. Tightly laced boots were a source of discomfort in several cases, and if the boots are not removed the laces should be cut. Of cases with fractured humerus some had splints and some had none, but all wore wide or narrow fold slings, and a few had the arm bound to the side by a binder, an arrangement which proved most comfortable.

The battle casualties with fractured ribs or pelvis had penetrating or perforating injuries of the chest or abdomen, and those with fractures of the skull or vertebral arches had evidence of damage to the brain or spinal cord. The visceral lesions overshadowed the symptoms and signs of the fractures, and no treatment of the bony injuries had been attempted. Three cases with fractures of vertebral bodies arrived without evidence of cord lesions, having been handled and transported correctly.

Only two men with severe cervico-facial injuries were admitted. One who had had one side of his face and neck blown away 9 days before, with great maxillary and mandibular destruction, could swallow nothing except small amounts of fluids, and was slowly starving. A gastrostomy led to temporary improvement, until a fatal bronchopneumonia supervened. He might have survived had a gastrostomy been done at an earlier stage. The other case was less severe, deglutition was scarcely affected, and he did remarkably well after wiring of the mandible and secondary suture.

AMPUTATIONS

No amputation case arrived in good condition, this being due to various factors, but particularly to insufficient general and local rest after operation. Some evacuated soon after operation died before they reached the base and the others exhibited various degrees of surgical shock. When rapid evacuation of amputation cases is imperative, the journey may be made more tolerable if a plaster cap is applied which can be removed and replaced like a finger cot. Such caps keep dressings in position, minimise swelling, give support to the stump, and protect it from the minor traumata incidental to transport. The removal of the cap is facilitated if in the first place the skin is smeared with vaseline, or covered with thin vaseline-gauze spreads.

Owing to skin destruction and other causes, amputations in war casualties cannot always be performed at the sites of election, and unorthodox skin flaps or shortish stumps may be unavoidable ; but too long stumps, and too tight suturing of skin flaps, are avoidable. We saw one case of Syme's amputation where sepsis had supervened, with partial sloughing of the heel flap. Secondary hæmorrhage occurred 10 days after the initial operation, necessitating reamputation through the leg. As it is more difficult to fashion a prosthesis for a Syme's amputation than for one at the site of election, should not the former method be discarded ?

Men with guillotine amputations were all dangerously ill on arrival. They all had severe pain, their wounds were heavily infected, the stumps were acutely tender, and loss of serum was a pronounced feature. A guillotine amputation is necessary only in the gravest cases ; in the others the few extra minutes required to fashion and loosely suture short skin flaps may increase the operative risk slightly, but this is more than counterbalanced by the greater safety and comfort of the subsequent journey. This lesson was clearly impressed on us by a comparison of the various types of amputation. The increasing availability and use of blood and plasma will greatly reduce the necessity for extreme haste.

The mention of haste raises another problem. Two men were admitted with guillotine amputations performed through the head of the tibia, about 2 in. below the joint, almost the thickest part of the bone. As reamputation would clearly be required, disarticulation through the knee would have been easier, and would have meant less hæmorrhage, less shock, less subsequent loss of serum, less pain and less septic absorption from the largely cartilaginous and tendinous raw areas left, while short skin flaps might have been fashioned from the skin, which in both cases was intact at the level of tibial section. The moral is this : disarticulation should be performed in every case where a guillotine amputation would otherwise be necessary immediately below the elbow or the knee.

Skin retraction in guillotine amputations always occurs, and some form of skin extension is essential ; otherwise the surgeon who reamputates may have to sacrifice more bone than is desirable. This extension should be applied at the time of operation, and U-shaped Elastoplast straps fixed over the stump dressing do much to counteract shrinking ; thereafter a plaster cap can be applied. A more elaborate method is to fix elastoplast extensions to the skin, apply the appropriate Thomas splint, and tie the strapping under tension to the side bars or end piece.

One last point may be interpolated here. Four men with amputations had a note in their field medical cards to the effect that the ablations had been performed for " gangrene," and anti-gas-gangrene serum and sulphanilamide had also been given. Anaerobic infection, therefore, was either diagnosed or suspected. If they were suffering from gas-gangrene the recovery-rate contrasts forcibly with our experience of similar cases treated days later at the base, where only one of six proved cases survived—sad confirmation of the dangers of delayed treatment in these infections.

WOUNDS INVOLVING THE BODY CAVITIES

Cases with spinal and cranial injuries withstood the ordeal of the journey better than those suffering from wounds of the other body cavities. One case with a hernia cerebri had signs of a meningo-encephalitis, but whether he contracted the infection at the time of injury or later it is impossible to tell ; three other similar cases arrived in good condition. A soldier, paraplegic from the sixth thoracic segment downwards, had required frequent catheterisation and had developed a severe cystitis and urethritis. Quite apart from the danger of infection, instrumentation is a difficult matter during transport, and an early suprapubic cystomy helps to circumvent both these problems. Instructions could be given to an orderly about regular emptying, and absorbent dressings would minimise the risk of bed soiling and consequent skin irritation. Protection of anæsthetic skin over pressure points such as the sacrum and heels is imperative, a pad of wool retained in position by bandages or adhesive plaster being efficient ; strapping alone does much to prevent direct friction, but may itself produce skin irritation. Two paraplegic cases had sacral pressure sores, and one a heel sore, which had not been treated before admission.

Men with penetrating and perforating abdominal and chest wounds should not be sent further than is absolutely

necessary, as in our experience they travelled badly. Twenty chest and eleven abdominal cases which were admitted were all seriously or dangerously ill, and the most careful selection should be made before men with such injuries are subjected to a long and, at the best of times, trying journey. A true assessment of the progress of such cases, favourable or unfavourable, can only be made by constant observation, preferably by the same person, and this is a sound reason for retaining these patients as long as possible at the first point where a surgical team is located. It is courting disaster to send soldiers with abdominal wounds straight to the base, even when the wounds are apparently simple, for it is axiomatic that any wound of the abdominal parietes should be treated as involving the peritoneal cavity until this can be definitely disproved. Two cases illustrate this point. One man had an intestinal obstruction as a result of a small perforating abdominal wound 5 days before, and another with a similar injury had developed a general peritonitis and ileus. We have been able to verify the well-established facts that the size of an entry wound may bear no relationship to the amount of internal damage, and that wounds of the buttock, groin and perineum are often complicated by injuries to abdominal or pelvic viscera, or to the urethra. The danger of overlooking a ruptured urethra was well exemplified in a man who was found on arrival to have widespread extravasation of urine from such a lesion, with gangrene of all the superficial tissues of the perineum and genitalia ; he died a few days later from secondary hæmorrhage. He might have recovered if an early suprapubic cystostomy had been performed and free drainage provided at the site of extravasation.

The remarks about abdominal cases apply with almost equal force to chest injuries, and the fact that wounds of the root of the neck or shoulder regions are liable to be accompanied by intrathoracic lesions was sometimes forgotten. Several men who arrived with large accumulations of blood or sanio-pus in a pleural cavity would have suffered less cardiac and respiratory embarrassment if a paracentesis had been performed before their evacuation. This procedure may tend to restart hæmorrhage, but the danger can be averted by air replacement and by retaining cases for 24–48 hours after paracentesis. It would then be easy to determine whether fresh bleeding had occurred, and if not the subsequent journey could be made in relative comfort and safety. One man with a sucking pneumothorax came under observation with such overwhelming infection of the pleura and parietes that he was beyond surgical aid.

This article was written before we knew that an official memorandum (M.E. Technical Instructions, 1941, No. 3—War Surgery) was in the course of production, and it is significant that, broadly speaking, the conclusions are similar, although the memorandum deals chiefly with experiences in other theatres of war.

We wish to express our thanks to Colonel H. J. A. Longmore for permission to publish this article, and to our medical and nursing colleagues on the staff of the hospital who have helped us in innumerable ways in the treatment of our cases. We are especially indebted to Colonel Monro, consultant in surgery, G.H.Q., M.E., for his criticism and advice.

REDUCTION OF DUST-BORNE INFECTION BY TREATMENT OF BEDCLOTHES

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THE possibility of aerial transmission in the spread of infection in hospital wards is becoming increasingly recognised. The infective agents may be conveyed through the air as droplets, droplet nuclei (Wells) or on dust particles. Dust as a vehicle may be of special importance in the spread of bacteria, such as streptococci, diphtheria bacilli, and staphylococci, which are particularly resistant to drying. The presence of large numbers of viable and virulent streptococci in blankets and dust has often been demonstrated (Deicher 1927, Thomas 1941). A number of examples of hospital cross-infection have already been reported in which streptococci carried in dust have been responsible (e.g., White 1937, Cruickshank 1938). Hare (1941) has succeeded in recovering streptococci from the environment of respiratory carriers, and considers that dry, dust-borne organisms may be important in the spread of streptococci from these carriers. Wright, Shone, and Tucker (1941) have recently shown that *Corynebacterium diphtheriæ* also may survive in the dust of hospital wards in sufficient numbers to constitute a risk of cross-infection.

Studies of the bacterial population of the air in hospital wards consistently show an increase each time the floors are swept and the beds made (Brown and Allison 1937), because of the dust which is distributed by these activities. Blanket dust, which consists largely of scales and fragments of wool fibres, is of special importance because it is buoyant and can remain in suspension for long periods. The seriousness of the risk of infection must be obvious, when it is realised that floor-dust may harbour millions of hæmolytic streptococci per gramme, and that a single blanket may contain many thousands of these organisms.

Attention has recently been focused on the possibilities of preventing the aerial spread of pathogenic micro-organisms by ultraviolet light (Wells and Wells 1936) and by antiseptic aerosols (Trillat 1938, Pulvertaft et al. 1939, Pulvertaft and Walker 1939, Twort, Baker, Finn and Powell 1940, Cruickshank 1940). The efficacy of these methods cannot be demonstrated on the dried organisms found in dust, for many of these are resistant to their action. Tests of the efficacy of U.V. light or antiseptic aerosols are often based on the reduction of the total number of organisms in air. These methods may be highly effective against undried organisms disseminated in fresh droplets from the respiratory tract, but in hospital wards the bulk of organisms in the air may be dust borne, and therefore not noticeably affected by these methods. An evaluation of their efficacy on other than dust-borne organisms may therefore be impossible.

Methods designed to reduce the number of dust-borne organisms in air are likely to assist in preventing the spread of diphtheria, streptococcal, and other respiratory infections in hospital wards. In addition, the elimination of dust from floors and blankets is necessary before other means, more particularly physical and chemical methods of sterilising air, can be investigated.

For laying dust a variety of oils have been in use for some years. Last year we discussed (van den Ende, Lush and Edward 1940) the use of one of these—spindle oil—and pointed out its probable value in ward hygiene. Oiling of floors of occupied rooms reduces the number of dust-borne organisms distributed into the air by the mechanical disturbances associated with ordinary occupation. This reduction cannot be so significant in hospital wards where most of the dust is derived from bedclothes. Investigations of methods designed to reduce the numbers of dust-borne organisms from bedclothes were conducted on two separate and distinct lines :

(*a*) The treatment of bedclothes with antiseptics to render them bactericidal for bacteria deposited on them. Some of these were partially successful but the majority were not bactericidal.

(*b*) The treatment with dust-laying preparations in order to reduce the amount of dust and therefore the number of dust-borne organisms which can be liberated. One of these—liquid paraffin—has in laboratory tests proved highly satisfactory.

EXPERIMENTS WITH ANTISEPTICS

Woollen and cotton textiles were treated with a large variety of antiseptics. With the majority the textiles were simply soaked in suitable solutions of the antiseptic and allowed to dry. Some of the antiseptics entered into chemical combination with wool proteins. The substances used included phenols, cresols, thymol, monochlor-thymol, monochlor-iso-thymol, terpineol, carvacrol, chlorcarvacrol, iodine, sodium and potassium

TABLE I—EFFECT OF LIQUID-PARAFFIN TREATMENT ON THE NUMBER OF BACTERIA AND AMOUNT OF DUST LIBERATED FROM TEXTILES BEATEN MECHANICALLY IN A SPECIALLY CONSTRUCTED APPARATUS

Material tested	Test organism	Percent. liquid paraffin in white spirit used	Bacterial counts. Control A	Control B	Treated A	Treated B	Reduction % compared with control A	Reduction % compared with control B	Amount of dust † Control A	Control B	Treated A	Treated B	Reduction % compared with control A	Reduction % compared with control B
Serge	Streptococci (sprayed)	100	1300	900	177	37	86	96	105	70	< 2	0	98	100
,,	,, ,,	50	800	480	61	1	92	99	102	71	< 2	0	98	100
,,	,, ,,	20	1600	960	176	23	89	96	116	75	7	5	94	93
,,	,, ,,	10	800	480	150	70	81	85	102	71	33	19	68	73
Woollen blanket	Staphylococci (sprayed)	30	4000	2500	20	3	99	99·9	121	51	6	2	95	96
,, ,,	Dry streptococci	30	490	11	27	0	94	100	35	10	0	0	100	100
,, ,,	,, ,,	30	504	18	2	0	99	100	142	82	6	5	96	94
,, ,,	,, ,,	50	408	13	44	1	89	92	76	31	4	2	95	94
Cotton sheeting	,, ,,	30*	508	24	218	5	57	79	112	40	11	4	90	90
,, ,,	Streptococci (sprayed)	30	1320	232	44	0	97	100	130	46	5	5	96	89

* Average of two experiments. † The figures represent readings on the photoelectric apparatus and not absolute values.
A. During the first 2-min. period after beating. B. During the 5-min. period 12–17 min. after beating.

iodide, resorcinol, hexyl resorcinol, eugenol carbinol, cetyl pyridinium bromide, "lissolamine," "triethanolamine oleate," sodium oleate, sodium lauryl sulphate and hypochlorites.

Test method.—Small squares (2 in. by 2 in.) of cotton and woollen material treated with antiseptic were allowed to dry, and then exposed to a mist of streptococci (Lancefield's group C) sprayed from serum-broth culture through an aerograph brush spray. Two hours later each square was vigorously shaken in a closed box over blood-agar plates, or firmly pressed on the surface of a plate. The centre of each blood-agar plate was then inoculated with a small loopful of the same culture. This final inoculation was necessary to determine whether or not the antiseptic was transferred to the surface of the plate in sufficient amount to be bacteriostatic. The tests with those substances in which there was evidence of significant bactericidal power were repeated, using powdered, vacuum-dried streptococci diluted with talc or kaolin.

As a final test, some of the antiseptics which were effective in the above tests were tried on larger strips of woollen material. These included hexyl resorcinol, resorcinol alone, resorcinol with glycerin, with cetyl pyridinium bromide or with both; carvacrol and chlorcarvacrol.

A number of highly bactericidal samples of serge were supplied to us by the director of the Wool Research Association at Leeds. The textiles were, however, unpleasantly hard, and their odour was objectionable. Samples of serge treated with a variety of moth-proofing agents were not significantly bactericidal.

Hexyl resorcinol and resorcinol (applied from 1% and 2–5% solutions respectively) when used alone were bactericidal only for sprayed streptococci. The addition of glycerin resulted in partial destruction also of dry streptococci, but the amount required resulted in excessive dampness. It appeared, therefore, that the effective treatment of textiles with antiseptics was not likely to be successful and further efforts were abandoned.

TREATMENT OF TEXTILES WITH DUST-LAYING PREPARATIONS

Through Mr. B. H. Wilsdon of the Wool Research Association at Leeds a number of textiles treated with rubber latex was placed at our disposal, and from Dr. J. W. C. Phillips a number of specimens treated with dextrin was obtained. None of these was capable of holding on to the dust deposited on them, though in some cases the amount of fragmentation and scaling of wool fibres was reduced.

On the advice of Dr. Phillips it was decided to investigate the dust-laying properties of medicinal paraffin on textiles. Dr. Phillips kindly prepared for us a number of samples of serge and other textiles treated with different amounts of liquid paraffin. The following method was employed in all the experiments.

The materials for treatment were soaked in 30–50% solution of medicinal liquid paraffin in a light petroleum product known commercially as white spirit. Samples of serge treated with pure liquid paraffin were also tested. After 5–15 min. they were transferred to a hydro-extractor and the excess solution removed by centrifuging at 1500 revolutions per min. for 2–5 min. To allow for evaporation of the white spirit they were then hung out for 24 hours in the open air. In hospital experiments, where laundry facilities are available, it has been possible to "dry off" the white spirit rapidly in heated drying chambers.

The amount of liquid paraffin retained by textiles has been determined by weighing the amount of oil removed by ether extraction in a soxhlet apparatus. It has been found that woollen and cotton materials treated with a 30% solution of liquid paraffin in white spirit retained approximately 2·5% and 6·5% by weight respectively of the oil.

Test methods and results.—Strips 5 in. by 15 in. of the material were infected with a serum-broth suspension of a coagulase negative *Staphylococcus albus* or hæmolytic streptococcus of Lancefield's group C and dried in the incubator at 37° C. For testing, an infected strip was placed in a machine specially constructed for this purpose by Dr. R. B. Bourdillon and Mr. O. M. Lidwell (1941) and beaten mechanically for 20 sec. The apparatus was so constructed that the cloth was beaten and firmly rubbed with each rotation of a roughened metal bar. This not only resulted in the liberation of free dust but was also an imitation of hard wear, breaking off numerous fibres and scales. The amount of dust liberated could be estimated photoelectrically, and at the same time blood-agar plates could be exposed at heights of 6 in., 18 in. and 36 in. above the cloth. A control unparaffined strip was included with each series of experiments. In a number of experiments the textiles were infected with a fine powder of hæmolytic streptococci which had been dried in vacuo and mixed with dust.

TABLE II—EFFECT OF LIQUID-PARAFFIN TREATMENT ON THE NUMBER OF BACTERIA LIBERATED FROM TEXTILES SHAKEN IN A CLOSED TANK

Material tested	Test organism	Percent. liquid paraffin in white spirit used	Bacterial counts Control A	Control B	Treated A	Treated B	Reduction % compared with control A	Reduction % compared with control B
Serge	Streptococci of group C (sprayed)	100	450	50	17	1	96	98
,,	Streptococci of group A (sprayed)	50	1000	210	73	9	93	96
,,	,,	20	2000	1240	55	8	97	99
,,	,,	10	1000	210	109	20	89	90
Woollen blanket	,,	30	328	33	14	0	96	100
Cotton sheeting	,,	30	269	2	5	0	98	100

A. Counts during the first 5-min. period after shaking.
B. Counts during the 5-min. period 10–15 min. after shaking.

The results of a number of typical experiments which are recorded in table I show that under the conditions of the test a great reduction in the amount of dust and bacteria liberated has resulted from the oil treatment. The reduction in the number of floating bacteria was

roughly parallel to the reduction in the number of floating dust particles. In the case of woollen materials, the minimum effective concentration is in the region of 20% paraffin in white spirit, whereas cotton requires treatment with a solution of 30% or more.

The optimal concentration appears to be 30%, since this ensures maximum effectiveness in the case of woollen materials and is the highest concentration that can be applied to cotton (sheets) without making them noticeably oily.

The samples of serge, blankets and sheets were subjected to a second laboratory test in which they were infected as in the previous test or with hæmolytic streptococci of Lancefield's group A, and then shaken in a specially constructed tank of 10 cu. ft. capacity. The tank was fitted with an ultraviolet lamp for the destruction of the free streptococci at the end of the experiment, and before the tank is reopened. Strips of material approximately 8 in. by 20 in. were used and plates were exposed for three consecutive 5-min. periods after shaking. The results summarised in table II confirm those of

TABLE III—EFFECT OF LIQUID-PARAFFIN TREATMENT ON THE NUMBER OF BACTERIA LIBERATED FROM BLANKETS AND SHEETS SHAKEN OR BEATEN IN CLOSED ROOMS

Material tested	Test organism	Percent. liquid paraffin in white spirit used	Bacterial counts					
			Control		Treated		Reduction % as compared with control	
			A	B	A	B	A	B
Woollen blanket	Dry streptococci	50	1234	197	5	< 1	99	100
,,	,,	30	1234	197	14	< 2	99	99
,,	Staphylococci (sprayed)	30	1850	333	77	13	96	96
Army blanket	,,	30	260	227	52	19	80	92
Army blanket *	,,	30	219	24	170	3	22	87
Cotton sheeting	,,	50 ‡	245	62	66	3	73	95
Cotton sheeting †	,,	30	234	58	78	12	67	79
Cotton sheeting	Dry streptococci	30	58	14	14	< 1	76	93 +

* Repeatedly autoclaved after treatment.
† Average of two experiments.
‡ Excessively oily and therefore not practicable.
A. Counts during the first 5-min. period after beating.
B. Counts during the 5-min. period 5–10 min. after beating.

the first series of experiments in showing that paraffin treatment results in a reduction of at least 90% in the number of bacteria which can be liberated by shaking woollen and cotton textiles.

Table III shows the results of a number of experiments in which single sheets or blankets were shaken in a closed room. Treated sheets and blankets and untreated controls were infected with a serum-broth suspension of staphylococci or streptococci from a scent spray, or by sprinkling with equal amounts of dry powdered streptococci mixed with autoclaved floor-dust. The results agree with earlier experiments in demonstrating that the number of bacteria which can be liberated from blankets is reduced by about 90% by treatment with 30% liquid paraffin in white spirit. The dust-laying effect on sheeting (cotton) of the same concentration of oil, though significant (70%+), is not as striking.

As a final test, six blankets from the bunks in a private air-raid shelter were used. Three of these were dry cleaned in white spirit without liquid paraffin, and marked as controls. The other three were treated with a 30% solution of liquid paraffin in white spirit. All six blankets were then returned to the bunks. The occupants of the shelter, who were not informed of the experiment, did not notice the difference in these blankets. After 16 days each set of three blankets was thoroughly shaken in a closed room. Blood-agar plates were exposed in the room for two consecutive 5-min. periods after the shaking. The average plate count for the first 5-min. period after shaking the control blankets was approximately 2400, and for the second period 490. The corresponding counts after shaking the treated blankets were 330 and 32. This was repeated twice and the mean ratio of total organisms liberated from treated and untreated blankets was 1 : 11.

DISCUSSION

These investigations have shown that the treatment of woollen and cotton textiles with a solution of medicinal paraffin in white spirit results in a great reduction in the amount of dust and dust-borne organisms which can be liberated from them. Effectively treated textiles are not excessively oily—in fact, it is usually difficult to distinguish them from the untreated ones by ordinary observation and touch—so that complaints from occupants of beds with treated bedclothes are unlikely. Experience has shown, however, that the method of application as described is laborious and relatively expensive when special equipment is not available, as is the case in the majority of hospital laundries. It was found, for instance, that where the suitable equipment was lacking the treatment of the bedclothes for a ward of 11 beds fully occupied 3 people for 5 hours. A total of 5 gallons of liquid paraffin at a cost of £3 and 10 gallons of white spirit (10*s.*) was required, although about two-thirds or more of these quantities were finally recovered and the remaining third was lost mainly through wastage, which was inevitable with the unsuitable equipment. The treatment has furthermore to be repeated after washing or frequent autoclaving. It cannot therefore be recommended for immediate adoption on a large scale, but it does deserve adequate trials in hospital wards. Such trials could to advantage be conducted in scarlet-fever or oto-rhino-laryngological wards, in which the numbers of dust-borne streptococci in the air are often large enough to allow the streptococci to be used as the indicator organism. Such trials are now in progress, and if, as seems probable, the treatment of bedclothes results in significant reduction of air-borne streptococci, a further and more extensive search for more suitable methods of application of liquid paraffin or other dust-laying oils will be justified.

A simple and practicable method of dust-laying on bedclothes may be of great assistance in preventing the spread of pathogens such as streptococci and *C. diphtheriæ* in hospital wards. It will furthermore prove valuable in the study of aerial spread of infection in general, by eliminating the dust-borne organisms which at present make a study of the pathogenic bacteria of the air very difficult.

SUMMARY

Attempts to render textiles bactericidal for bacteria deposited on them have been unsuccessful.

A method is described for the treatment of bedclothes with medicinal paraffin dissolved in white spirit. This treatment reduces the amount of dust which can be liberated from blankets and sheets by approximately 90% without rendering them objectionably oily.

The method is too laborious for large-scale adoption but deserves further trial in hospital wards. If it can be simplified, it should help to prevent the spread of ward infections.

Our thanks are due to Mr. J. W. C. Phillips for suggesting the use of liquid paraffin for laying dust on textiles, and for providing samples of paraffin-treated materials; to Mr. B. H. Wilsdon, of the Wool Industries Research Association, Leeds, for his advice and for samples of serge treated with waterproofing, mothproofing and bactericidal agents; to Dr. R. B. Bourdillon, on whose advice these investigations have been undertaken, and who supplied us with the mechanical beater; and to Dr. C. H. Andrewes for the interest he has shown throughout the investigations.

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FOUR CASES OF ABDOMINAL ANEURYSM

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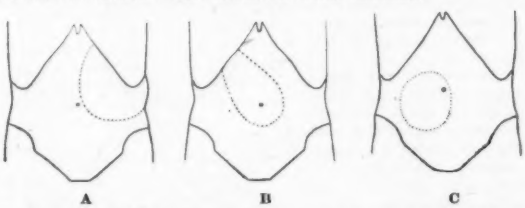
Osler (1905) gives credit to Vesalius for the first description in 1567 of an abdominal aneurysm, and Kampmeier (1936) has found 386 cases of abdominal aneurysm recorded in all the literature. Thus, while abdominal aneurysms provide some of the most varied and dramatic pictures seen in clinical medicine, it is not given to many observers to see three cases within a year, as E. H. Goodman did in New York in 1914. At Redhill County Hospital we have recently seen four cases in just over a year. Goodman's cases all presented themselves with left-sided abdominal or loin pain of short duration, but our four cases were more varied in their symptoms. Three were aneurysms of the abdominal aorta and the fourth was an aneurysm of the cœliac axis.

CASE-RECORDS

Case 1.—An architect, aged 57. Probably acquired syphilis at 18, but was untreated because there was no obvious chancre. Apart from constipation he was well until 4 years before admission. During these years he had constant pain in the left lower lumbar region and had gradually become more anæmic. For 4 months before admission there had been an exacerbation of this pain, with radiation down the left sciatic nerve, often so severe that morphia had to be given. Severe scrotal pain had caused him to wear a suspensory bandage. For a fortnight before admission he had bad attacks of dyspnœa on exertion and even at rest.

He was noticeably thin, anæmic, and orthopnœic. The abdomen was prominent; in its left upper quadrant and in the left loin was a rounded tumour (fig. 1A) expanding with the pulse. Except in front it was dull on percussion and its upward pressure appeared to have caused compression and partial collapse of the lower lobe of the left lung. The heart showed no enlargement and no valvular murmurs. The blood-pressure was 120/60; but on the evening after admission and on other occasions he collapsed for short periods in which there was acute dyspnœa and a rapid weak pulse (B.P. 80/50). The pulse-rate varied from 80 to 100 per min. These attacks were at times brought on when he was lifted in bed and in them he was sometimes unconscious for a few minutes.



A B C

Fig. 1—A, B and C show areas of aneurysms in cases 1, 2 and 3 as determined by palpation. In each case a smooth, expansile pulsating tumour was felt.

Radiogram of the chest was normal, but that of the lumbar spine showed erosion of the anterior aspects of the first and second lumbar vertebræ (fig. 2). Electrocardiogram was normal. Blood-count: red cells 1,600,000 per c.mm.; Hb. 36%; C.I. 1·1; reticulocytes 9%; mean cell volume 125 cu. μ. Blood W.R. strongly positive. He died after being in hospital for nine days, and was euphoric and rambling for the last few days of his life. His death occurred during one of the dyspnœic attacks.

At autopsy the heart was of average size with normal pericardium, and competent undiseased valves. The aorta showed some widening of the sinuses of Valsalva in which were numerous syphilitic scars. Atheromatous changes with ulceration and calcification were mixed with the syphilitic changes and spread down from the thoracic to the abdominal aorta. In the anterior wall of the aorta at the level of the renal vessels was a large oval orifice measuring 2 in. × 1 in. This communicated with an aneurysm measuring 10 in. × 9 in. × 8 in. (fig. 3). The aneurysm spread to the left across the front of the aorta and the left kidney was embedded in its wall. The kidney substance was normal but pale, and the left renal artery was filled with antemortem clot. The wall of the aneurysm was entirely of blood-clot and reached down to the left psoas muscle, eroding the first and second lumbar vertebræ. On the right side the aneurysm crossed the midline, but did not involve the kidney nor compress the inferior vena cava. The wall of the aneurysm was not fully organised and was still dark red, giving the impression of a recent rapid increase in size. Downwards it extended to the bifurcation of the aorta and here on the left side was a retroperitoneal rupture with much fluid blood. There was no free blood in the peritoneal cavity. Section of the aortic wall (fig. 4) histologically suggested syphilis and also showed definite arteriosclerotic change.

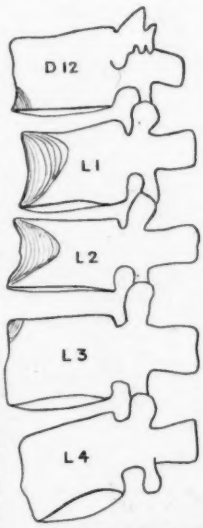


Fig. 2—Tracing of vertebral radiogram in case 1. Advanced erosion of L 1 and 2 and slight early erosion of adjacent parts of D 12 and L 3.

Case 2.—A retired chemist, aged 69. Had lived in India from 26 to 62 years of age. There he had cholera, enteric fever and amœbic dysentery, the last at 56. He was an A1 insurance life at 30 and B1 at 44. For many years he noticed a "big abdominal pulse," but otherwise had no symptoms till he was 64, when he began to experience slight angina of effort. About 6 weeks before admission he had two attacks of faintness which forced him to sit down, and soon afterwards he had some vague abdominal discomfort; subsequently he had no appetite. A few days before admission he had a severe attack of faintness and weakness and later passed some blood per rectum. An abdominal swelling was first noticed at this time.

He was pale and orthopnœic but quite comfortable. He was alert mentally and in many ways young for his years. Heart and lungs were normal, and the pulses in wrists and thighs were all synchronous. Blood-pressure in the arms was 120/80, and in the left thigh 145/80. In the abdomen was a very evident expansile pulsating swelling whose apparent contour is shown in fig. 1B. It was about 5 in. in diameter, with an extension up under the right ribs and down 1½ in. below the umbilicus. The palpating finger could be passed between the tumour and the ribs, and it could be moved slightly from side to side. It moved slightly with respiration and did not extend into the loin. No bruit was audible over the tumour.

His temperature ranged up to 100°–101° F. during the first week and his pulse-rate was 90. Blood W.R. and Kahn reaction twice negative. Red cells 3,600,000 per c.mm.; Hb. 70% (no improvement with iron therapy). Abdominal radiogram showed a soft-tissue mass free from calcification and not eroding the vertebræ. Gall-bladder was normal to dye test. A uroselectan radiogram of the renal tracts showed a spastic right ureter; otherwise no abnormality apart from medial displacement of the left ureter in its middle part (fig. 5). Electrocardiogram was normal. There was no evidence of bleeding from the bowel at any time, and no pain apart from a few abdominal cramps associated with bowel movements, and later realised to be due to interference with the mesenteric blood-supply. On one occasion after the passage of a large stool there was moderate shock. With rest the patient's general condition improved; but the local abdominal signs did not change. He was discharged after seven weeks in hospital. He was readmitted 16 days later because he had collapsed with severe abdominal pain and vomiting. These symptoms had continued for 12 hours. He was shocked and his pulse was weak. Temperature was subnormal and pulse-rate 92. There was a large globular mass protruding above the umbilicus. Pulsation was not observed in it and the doctor who saw him before admission had diagnosed carcinoma of the stomach. The patient died 24 hours after readmission when he collapsed suddenly after vomiting.

At autopsy the heart was normal apart from atheroma of the coronary arteries. The aorta showed advanced atheromatous change, with ulceration and calcification extending from the thoracic to the abdominal part. There was some œdema of the lung bases. A large aneurysm of the abdominal aorta extended from immediately below the origin of the renal

arteries to within an inch of the bifurcation of the aorta (fig. 6). This had grown forwards into the mesentery and had displaced it laterally. There was no backward extension or erosion of the vertebræ. The cavity of the aneurysm was about 8 in. in diameter and spherical. The right half was filled with old laminated blood-clot, whereas on the left side there was some recent clotting without lamination; it was here that the aneurysm had perforated. There was much free blood in the peritoneal cavity and in the retroperitoneal space. Section of the aortic wall (fig. 7) showed definite arterio-sclerotic changes and Dr. Hamilton-Paterson considered that there was probably also evidence of syphilis.

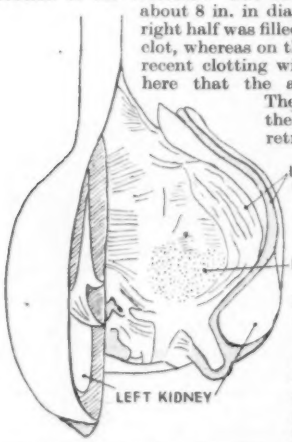


FIG. 3—Sectional view of aneurysm in case 1, showing laminæ of clot and incorporation of left kidney in wall of aneurysm.

CASE 3.—A plasterer, aged 62. He had no previous illnesses apart from two gonococcal infections, one 40 years and the other 2½ years before admission. He had tingling and burning sensations in the right testicle and in the penis at intervals in the 3 years before admission. The day before admission he had severe aching pain in the left groin and had frequently vomited foul brownish material. The presence of an old left inguinal hernia led to a diagnosis of irreducible hernia and he was sent to the hospital. His symptoms continued and because of the abdominal distension a barium X-ray examination of the intestinal tract was made. This showed distended coils of gut in the upper abdomen, and although the pulse-rate was 70 a small-gut obstruction was diagnosed and laparotomy was performed. A large abdominal aneurysm was found reaching from 2 in. above the umbilicus to the bifurcation of the aorta. It was about 4 in. in diameter and was causing collapse of the cæcum and the lower part of the small gut.

FIG. 5—Uroselectan radiogram of renal tracts in case 2 showing soft-tissue mass extending to right of spine, and medial displacement of left ureter.

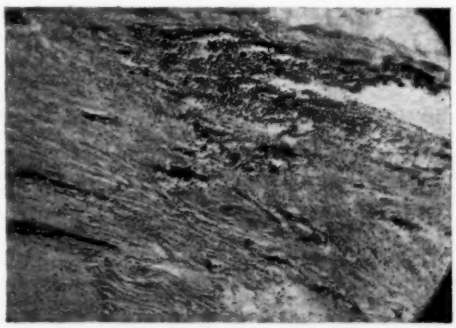


FIG. 4—Section through wall of aneurysm in case 1. In upper part a large perivascular collection of lymph and plasma cells is lying between media and adventitia. Adventitia thickened and fibrotic; media thinned and excessively vascular and cellular. Grossly thickened intima containing fat can be seen in lower part.

The patient was later transferred to the medical wards where he was observed to have an expansile pulsating swelling in the right side of the abdomen and more in the lower part (fig. 1c). No murmur could be heard in it. There was generalised arteriosclerosis, but the heart showed no abnormal signs and the B.P. in both leg and arm was 120/76. In a radiogram of the chest the heart and abdominal aorta showed no significant abnormality. The blood and C.S.F. were normal, and the W.R. in each was negative. The urine was normal. The patient continued to complain of paræsthesiæ in the penis and the testicle and of pruritus ani, but on the whole he was very well and could walk strongly at the time of his discharge after 5 weeks. The bowels gave no further trouble. At home he was well for a further 5 weeks and then suddenly collapsed with intense pain in the right groin. He was admitted very shocked and was given morphia. He vomited copiously both before and after admission. The pulsating swelling remained prominent, and the pulses in the legs remained palpable. He passed no urine and remained in a collapsed condition until his death nearly a day later.

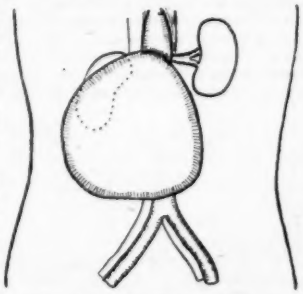


FIG. 6—Approximate extent of aneurysm in case 2.

At autopsy the heart was normal but the thoracic aorta showed advanced atheroma and the plaques became almost continuous in the first part of the abdominal aorta. There was no ulceration and no macroscopic evidence of syphilis. About an inch below the openings of the renal arteries was a saccular aneurysm of the aorta about 4 in. × 3 in. × 3 in. spreading out on the right side. It reached downwards as far as the bifurcation. Posteriorly the internal layer had stripped and formed a dissecting aneurysm within the saccular one. The left wall was composed of fibrous tissue and lined by a thin layer of laminated clot. On the right side the wall could not be found and there was a large mass of retroperitoneal blood-clot extending to the lateral wall of the abdomen and entirely surrounding the right kidney and the head of the pancreas. The right kidney was pale, probably as a result of compression. The right ureter was normal, but the left was displaced medially by the aneurysm. The viscera were otherwise free of significant change. Sections of the aortic wall (fig. 8) showed changes mainly of arteriosclerotic type, though Dr. Paterson did not consider that it was possible to exclude a syphilitic factor since there was considerable lymphocytic infiltration of both adventitia and media.

CASE 4.—A ticket inspector, aged 59. A thin man with a 6 weeks' history of cough and slight malaise. He had felt extremely unwell for a week. On admission his temperature was 101·5° F. and he had signs of pneumonia in the left lower lobe. B.P. 170/100. Sputum contained no organisms of note, but he was given M. & B. 693. The pneumonia

resolved very slowly. A fortnight after admission he began to complain of epigastric and umbilical pains. These often came on about 2 hours after food and were a recurrence of pain which he had noticed for some months before admission. A week later doughiness of the abdomen was noticed after a very persistent pain. The pains became more frequent and severe, and at night were protracted and agonising. Gastric splashing and abdominal tympany were observed during attacks, and after one of them a small amount of blood was vomited. A radiogram of the stomach showed two large lesser-curvature ulcers. Dietary treatment was given but with only partial relief. The day before his death he had severe epigastric pain and next morning œdema of the right leg and foot was observed. In the afternoon he suddenly collapsed, was blanched and extremely dyspnœic, with a rapid and threadlike pulse. He died in a few minutes.

At autopsy he had a hypertrophied left ventricle. There was little atheroma although some was present in the abdominal aorta. On the cœliac axis just below its commencement was a ruptured aneurysm about 1½ in. in diameter, its wall formed of fibrin and blood-clot. Large quantities of blood were found in the right side of the abdomen behind the peritoneum, extending over the brim of the pelvis and into the right iliac fossa. Much of the blood was firmly clotted and had been extravasated for at least a week. It had compressed the right external iliac veins and caused the œdema of the right foot. Two gastric ulcers were present on the lesser curvature, where the main artery was normal. The blood W.R. was negative, but histological examination of the aneurysm wall again showed a widespread infiltration with lymphocytes (fig. 9). These were particularly numerous in the thickened adventitia.

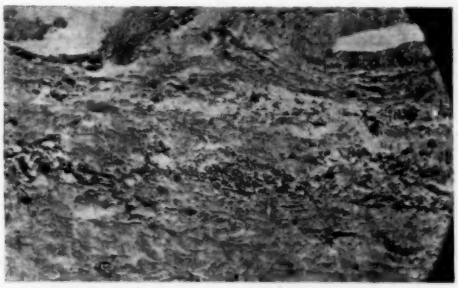


FIG. 7—Section through wall of aneurysm in case 2. Fatty adventitia containing large blood-vessels seen in upper part; rest of figure shows vascular fragmented media containing small perivascular collections of lymphocytes, plasma cells and occasional macrophages.

DIAGNOSIS

Of these four cases of abdominal aneurysm, in one there was a backward extension into the left loin, and two a forward extension. All these three gave the only absolutely incontrovertible sign of abdominal aneurysm—a pulsating, expansile abdominal tumour. Although a systolic bruit over the aneurysm has often been reported, we did not hear it in our cases. The first case by its backward extension caused severe backache, with later symptoms which suggested both sciatica and left renal disease. The forward pressure on the mesentery and gut of one of the other two large aneurysms caused abdominal cramps and the passage of blood per rectum. The last of these aortic cases developed the symptoms and X-ray appearances of small-gut obstruction. In all three scrotal pains suggestive of renal disease were a feature. In one pressure on a kidney and the ureters finally caused a urinary suppression to which the fall of blood-pressure contributed. The fourth case, a small aneurysm of the cœliac axis associated with gastric ulcers, caused bouts of considerable epigastric pain by retroperitoneal leaking of blood. It gave no signs characteristic of abdominal aneurysm.

Such varied clinical pictures are a feature of abdominal aneurysms. As Nixon (1911) says, the symptoms show "a variability hardly surprising when the potentialities of the abdominal aorta and its branches are borne in mind." Some of the possible symptoms are:

Pain, although only present at first in one of our cases, is the outstanding symptom. Kampmeier (1936) found it in 55 out of 60 cases, and constant boring or aching pain in these subjects was twice as common as intermittent pain. The pain was either in the back or abdomen, and periods of added lancinating pains of awful severity were frequent, particularly in cases of erosion of the vertebræ (usually D 12 and L 1 and 2) and of pressure on the nerve-roots. The pain in Nixon's large series in different cases simulated renal colic, gall-bladder disease, and sciatica.

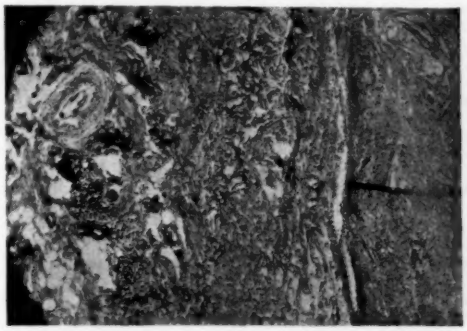


FIG. 8—Section through wall of aneurysm in case 3. On extreme left is fringe of hæmorrhage which widely infiltrated both adventitia and media. Next there is a perivascular collection of lymphocytes around an adventitial blood-vessel. In centre is the media showing fragmentation and small deposits of lymphocytes and plasma cells. On right is thickened intima containing lipoid acicular spaces.

Pressure on viscera has been reported to result in dysphagia, vomiting, symptoms of pyloric or intestinal obstruction and melæna. Symptoms suggestive of peptic ulcer may be followed by hæmatemesis if the aneurysm ruptures into the compressed stomach or duodenum. The spinal cord may be compressed to cause paraplegia (Hutton and Galbraith 1938). Uræmia may result from compression of both ureters or by occlusion of the renal artery openings in the walls of the aneurysmal sac (James 1935). Obstructive jaundice has been caused by pressure on the common bile-duct (Bryant 1903).

Rupture of the aneurysm, apart from the tearing pain and shock which are its chief features, results in a variety of mistaken diagnoses. Thus the more frequent retroperitoneal rupture may simulate perinephric abscess (Rusche and Bacon 1935), psoas abscess and appendix abscess. Jump and Leaman (1939) report a case of intraperitoneal rupture diagnosed as a perforated peptic ulcer.

FIG. 9—Section through wall of aneurysm in case 4. Patchy infiltration of media with lymphocytes. Adventitia thickened and fibrous, showing gross infiltration with plasma cells and lymphocytes. Small areas of recent hæmorrhage in adventitia.

Obstruction of blood-vessels either outside the aneurysm, such as the inferior vena cava, or arising from it, such as the renal and iliac vessels, results respectively in venous congestion of the lower limbs, urinary suppression and pain, or weakness or gangrene of the legs (Bryant 1903, Bishop and Trubek 1935).

Where the whole sac has been full of clot it has, like our second case, been diagnosed as a malignant tumour.

It is thus not surprising to learn from Osler that Valisnieri's case in 1719 was opened by an "unskilful

surgeon," or to find that only 18 of Bryant's 54 cases were diagnosed during life. In only 8 of these cases was expansile pulsation found, although 33 showed pulsation and 31 had tumours; 26 had a systolic murmur over the tumour.

Some diagnostic help may come from radiography of the abdomen. A soft-tissue shadow may be seen, but as Farmer (1927) points out, it must have calcified laminæ in its substance to rouse strong suspicion of abdominal aneurysm. Better evidence is given by posterior aneurysms which erode the lowest dorsal and upper lumbar vertebræ, or even the transverse processes and the lower ribs on the left side; 18 out of 24 of Kampmeier's cases showed vertebral erosion; 4 of his cases showed a pulsating tumour on the screen and 4 caused gastric displacement.

The Wassermann reaction may afford help, but even in syphilitic cases it may be negative.

ÆTIOLOGY

The ætiological factors in these aneurysms are syphilis, trauma, arteriosclerosis, tuberculosis rarely (Dafoe 1925), and possibly rheumatism (Nixon). Males are predominantly affected—e.g., 90% of Bryant's 54 cases and 84% of Nixon's 179 cases were in men. All the writers who have described long series of cases (Nixon, Bryant, Kampmeier and Osler) agree on the predominance of syphilitic cases, and only writers describing a few older cases (McNeely 1937, Jump and Leaman 1939) are impressed by the part played by arteriosclerosis. Very many syphilitic cases were under 45.

The best examples of the effect of direct trauma in producing abdominal aneurysms are in Valisnieri's case of a cartman with syphilis, over whose abdomen a cartwheel had passed, and in McFadzean's (1928) old trapeze artist. In the latter no less than four atheromatous aneurysms were present in the often compressed abdominal aorta, while the thoracic aorta remained healthy. Constant heavy manual work by subjects with aortic disease has been a more frequent factor than direct trauma in producing abdominal aneurysms. The comparative lack of support of the wall of the branching upper abdominal aorta is said to be responsible for the greater incidence of syphilitic aneurysms in the upper abdomen. Such aneurysms are usually saccular, while the arteriosclerotic aneurysms of the lower aorta are often fusiform.

Osler thought that abdominal aneurysms were ten times rarer than thoracic aneurysms. In Nixon's series 15 cases had both abdominal and thoracic aneurysms, but this association is very rare. Hutton and Galbraith (1938) report an interesting case of G.P.I. associated with abdominal aneurysm, and Nixon (1911) a girl of 20 with congenital syphilis who developed an abdominal aneurysm.

PROGNOSIS

The short history of all cases described is noteworthy; from diagnosis to death the period was usually less than a year. But as in our first case the history often suggests the development of the aneurysm over a period of a few years. Death is nearly always due to rupture and hæmorrhage. Retroperitoneal rupture is often gradual and intermittent, intraperitoneal hæmorrhage is much more rapidly fatal; 19 of Bryant's series ruptured retroperitoneally, 12 intraperitoneally, 8 into the pleura, and 2 into the mediastinum; only 2 died vascular deaths with intact aneurysms. Hutton and Galbraith's case with an aneurysm history of 11 years died as a result of a paraplegia.

SUMMARY

In 4 cases of abdominal aneurysm a syphilitic ætiology was probable in the first two, and possible in the third.

The varied symptoms were backache, sciatica, testicular pain, melæna, constipation, abdominal cramps, suppression of urine and symptoms of intestinal obstruction.

In the first 3 cases the presence of an expansile pulsating abdominal tumour should have prevented misdiagnosis. In the fourth case, one of aneurysm of the cœliac axis, the diagnosis was obscured by the presence of gastric ulcers. Spinal X-ray and blood W.R. examination gave further help in one case only.

The course from diagnosis to death by retroperitoneal rupture was 9 days in the first case and about 10 weeks in the second and third.

Autopsy showed in each case evidence of previous smaller bleedings and emphasised the liability of the renal tracts to suffer from compression by these aneurysms. In 2 cases the aneurysm caused medial displacement of a ureter.

Microscopy, while showing in all cases marked cellularity of the vessel coats with thinning of the media and thickening of the intima, only strongly supported a syphilitic diagnosis in the first case. In the other 2 aortic cases the picture was too much complicated by arteriosclerotic change to be diagnostic. In the cœliac-axis aneurysm the infiltration of the vessel coats by lymphocytes was evidently not a syphilitic phenomenon.

I am grateful to Dr. J. Hamilton-Paterson for his help in the pathological examination of these cases.

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PRESERVATION OF ORGANIC PHOSPHORUS COMPOUNDS IN STORED BLOOD BY GLUCOSE

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IN the following investigations, the rôle of glucose in preserving stored erythrocytes has been studied in relation to its possible effects in inhibiting the breakdown of the phosphoric esters of erythrocytes. It is well known that phosphorus is concerned in glycolysis. A summary of work on this subject, beginning with observations by Rona and Doblin (1911), is given in a paper by Guest (1932). Guest himself shows that in defibrinated blood kept at 37° C. sugar decreases steadily for some hours, while inorganic phosphate remains almost stationary. When glycolysis ceases because sugar has all been used up, a rapid liberation of inorganic phosphate from the organic phosphate of the erythrocytes occurs. Guest shows that if sugar is added to erythrocytes, glycolysis is prolonged and the breakdown of organic phosphates correspondingly delayed. In view of this association of phosphate and glucose, it was thought probable that the addition of glucose to blood (a procedure originated by Rouse and Turner in 1916 and adopted by the Medical Research Council during the present war) might inhibit the gradual but continuous breakdown of organic phosphate which takes place during prolonged storage at 4° C. Such an inhibition has, in fact, been observed.

FIRST INVESTIGATION

Freshly drawn citrated human blood was divided into two samples. To one, sufficient glucose (10%) was added to give a final concentration of 1%; to the other, an equivalent amount of normal saline was added. The samples were kept at 4° C. for 10–14 days and then centrifuged at 3000 r.p.m. for 30 min. The supernatant plasma was removed and inorganic phosphorus in cells and plasma measured by the method of Briggs (1922). The pH was measured with the glass electrode after hæmolysing the cells by freezing.

It was apparent that glucose caused a marked decrease in the breakdown of organic phosphate. In six experiments the amount of organic phosphate liberated in 10–14 days averaged two and a half times as much in the absence of glucose as in its presence. A typical result is shown in table I.

The difference in inorganic phosphate liberated was not due to increased acidity resulting from the presence

of glucose, since the difference in pH between the two cell samples was too small to affect phosphatase activity to a significant extent (Martland, Hansman and Robison 1924).

TABLE I

—	pH cells	Inorganic P (mg. %)	
		Cells	Plasma
Cells stored without glucose ..	7·08	24·1	3·36
Cells stored with glucose ..	6·95	11·8	2·88

SECOND INVESTIGATION

The influence of glucose on phosphorolysis in cells separated from plasma was next investigated and at the same time the influence of hæmolysis on phosphorolysis was considered.

The procedure must be aseptic. Fresh citrated blood was centrifuged. The supernatant plasma, intermediate layer of leucocytes and upper layer of erythrocytes were all removed with a capillary pipette and the residual cells divided into two parts, A and B. Sample B was hæmolysed by repeated freezing and thawing and then A and B were each subdivided into A_1 and a and B_1 and b. To samples a and b glucose was added to a final concentration of 1%; the corresponding amounts of saline being added to A_1 and B_1. All four specimens were kept for 10–14 days at 4° C. After this time they were well shaken and inorganic phosphate and pH measured.

TABLE II

Expt.	Cells	Storage (days)	Glucose added (%)	pH cells	Inorganic P (mg. %)
1	Unhæmolysed (A_1)	10	0	7·18	20·3
	,, (a)	10	1	7·04	4·8
	Hæmolysed (B_1)	10	0	7·18	17·9
	,, (b)	10	1	7·04	13·6
2	Unhæmolysed (A_1)	14	0	7·19	27·5
	,, (a)	14	1	7·19	2·6
	Hæmolysed (B_1)	14	0	7·19	25·0
	,, (b)	14	1	7·26	23·6

The two examples in table II, selected from a number of other experiments, show that even in centrifuged erythrocytes, containing only the merest trace of plasma, glucose evokes a striking decrease in phosphorolysis amounting sometimes to almost complete inhibition (experiment 2). On the other hand, hæmolysis of cells brings the inhibiting action of glucose to an end, phosphorolysis being as active in hæmolysed cells with glucose as it is in the absence of glucose. Such slight evidence of glucose inhibition as is evident may well be due to the persistence of some intact erythrocytes in the hæmolysed mass.

Another observation emerges from these experiments. The addition of glucose to stored erythrocytes has little effect on their ultimate pH—usually they are very slightly more acid; sometimes they are less. Finally, it may be noted that originally unhæmolysed cells, packed by centrifuging, showed less than 0·2% hæmolysis after being kept for 14 days at 4° C.

DISCUSSION

The findings here recorded may be explained to some extent by a consideration of the nature of glycolysis and phosphorolysis. These are both cellular phenomena in which plasma plays no part. The exact course of glycolysis is unknown, but the following simplification of an account by Rapoport and Guest (1938) probably approximates to the truth. The chief organic phosphates of human erythrocytes are diphosphoglycerate and adenosine triphosphate, the former constituting the bulk of the phosphoric esters. The breakdown of diphosphoglycerate yields inorganic phosphate. This phosphate combines with glucose to form hexosephosphate which is ultimately reconverted into diphosphoglycerate. At some stage in this process adenosine triphosphate is concerned, probably donating phosphate to glucose and thus forming hexose phosphate and adenylic acid. The latter then accepts more phosphate from inorganic phosphate or diphosphoglycerate to reproduce adenosine triphosphate. This cycle is maintained by the enzymic action of phosphatase and in it glucose is used up and disappears, this part of the process constituting glycolysis. The conservation of diphosphoglycerate depends on the maintenance of glycolysis and this in turn on the presence of glucose. In the circulating blood the supply of glucose is practically unlimited and the re-esterification of inorganic phosphate derived from diphosphoglycerate is probably complete. In blood drawn and stored without glucose, the glucose naturally present (about 0·1%) is soon used up. The conversion of phosphate into hexosephosphate is no longer possible and so the reconstitution of diphosphoglycerate from inorganic phosphate comes to an end and the diphosphoglycerate progressively breaks down under the action of phosphatase into inorganic phosphate. In the case of stored blood to which glucose is added, however, the reserve of glucose is so great that the hexose-phosphate cycle can be maintained for a much longer time; diphosphoglycerate is conserved and inorganic phosphate appears in small amounts.

The reason why the conservation of phosphoric esters is not apparent in hæmolysed cells may lie in the absence of glycolysis in such a hæmolysed system. In the absence of glycolysis, no resinthesis of phospheric esters occurs. That glycolysis is inhibited by hæmolysis has long been known (Rona and Arnheim 1913); it has been suggested that the process of glycolysis is, in some obscure way, associated with the integrity of the cell surface.

The inhibition of phosphorolysis by glucose adds one more to the various ways in which glucose aids the preservation of stored erythrocytes; these actions may be summarised as follows:—

(1) Glucose delays the breakdown of organic into inorganic phosphates.

(2) It helps to maintain the relative impermeability of the erythrocyte to cation. In this way the leakage of salts (and hence of water) into the cell is checked; the cell takes longer to swell to its critical "bursting volume" and hæmolysis is delayed.

(3) Glucose is probably adsorbed into the actual cell surface, since it has been shown (Maizels and Whittaker 1940) that the critical bursting volume of cells in glucose is 10% greater than that of cells in saline. In this way, cells in solutions containing glucose can tolerate a higher content of salts and water without hæmolysis occurring.

It cannot be said definitely that the conservation of organic phosphates in erythrocytes necessarily helps cell preservation; there is no evidence, for example, that the accumulation of inorganic phosphate in cells causes any important shift in the pH of the cell, although it is possible that the breakdown products of phosphoric esters might have a higher osmotic pressure than that of the original compound from which they were derived. If this were the case, then increased hydrolysis of phosphoric esters would raise the osmotic pressure of the erythrocyte and predispose to hæmolysis not only in saline solutions but also under ordinary conditions of storage in plasma. Moreover, on general grounds, it is probable that an agent which helps to keep cell chemistry normal will also assist cell preservation, and that the maintenance of a normal physiological cycle of metabolism within the erythrocyte should help to sustain its nutrition and to aid survival.

CONCLUSION

The addition of glucose to stored blood inhibits the breakdown of organic phosphates. It is thought that this may be a factor in aiding the survival of the erythrocytes.

My thanks are due to Mr. C. Pope of the Wellcome Research Institute, who has carried out all the pH determinations on the various blood samples examined.

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ESTIMATION OF PROTHROMBIN

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THE occurrence of hypoprothrombinæmia with associated hæmorrhagic tendency in jaundice and in the hæmorrhagic disease of the newborn, and its prompt response to vitamin-K therapy, have rendered a simple test for prothrobin estimation highly desirable. The method described by Quick (1935) still remains the most suitable owing to its simplicity. There is, however, some disagreement concerning the normal prothrombin coagulation-time. Quick in his original article gave this as 22 sec., but later (1936) as 11–15 sec. Other workers (Illingworth, Kark and Souter, Crosbie and Scarborough, &c.) give times of 15–25 sec. for normal controls. The cause of these variations appears to be the different methods employed in preparing the thromboplastin solutions from brain. Quick recommends acetone-dried extracts as the most active and most suitable for storing. He mentions the use of aqueous extracts, but does not use them for routine purposes. Most other workers have used either acetone-dried or air-dried extracts. The method we have adopted obviates the necessity of drying the brain, and thereby greatly simplifies the procedure.

A portion of brain is carefully freed of membranes and blood-vessels, washed, macerated to a smooth paste in a mortar, and suspended in ten times its weight of saline. Either human or rabbit brain may be used. The saline-suspension is stored in an air-tight screw-cap bottle at 4° C. Before use it is centrifuged, and the supernatant clear fluid is used in the estimation.

We have found that these aqueous extracts give constant coagulation-times for more than a month. It is essential to store them in the cold as they quickly deteriorate at room temperature. We always have several extracts available, and make use of that which gives a coagulation-time with a normal plasma of 13–15 secs. Our results with normal controls, which have been obtained with many different extracts were as follows.

No. of controls	97	Longest time (sec.)	16
Shortest time (sec.)	10	Av. for group (sec.)	13·97

It will be seen that these findings agree with Quick's statements that 11–15 sec. may be taken as normal. The longer times obtained by other workers may be due to loss of activity in dehydration, or in heating the brain, as recommended by Quick, in order to destroy any prothrombin content of the brain itself. By testing with prothrombin-free plasma we have found our extracts to be free of prothrombin. Heating the brain extract above 60° C. rapidly destroys the activity of the thromboplastin.

Recently viper-venom has been recommended as an alternative source of thromboplastin (Fullerton 1940, Hobson and Witts 1940) either with or without the addition of lecithin. There seems to us no advantage in this, for the shorter times obtained with venom do not make minor variations from the normal easier to detect. Also, as pointed out by Hobson and Witts, different batches of venom give different results. Again, viper-venom is expensive while brain may be obtained at no cost from the post-mortem room.

ESTIMATION IN INFANTS

The difficulty in prothrombin estimations on infants is to obtain the blood, for if repeated tests are to be made venous (or fontanelle) puncture is not a practical procedure. Waddell and Lawson (1940) employed the technique of Bray and Kelly (1940), using blood obtained by heel-puncture, and carrying out the estimation on whole blood. As these authors have pointed out, the end-point, using blood instead of plasma, is not sharp, and we have found it difficult to time accurately. We therefore devised the following technique for obtaining plasma from heel-puncture.

A white-cell pipette (largest size available) is filled to the mark "1" with M/10 potassium-oxalate solution. The infant's warmed foot is pricked so as to obtain a free flow of blood. It is essential to see that the foot is well warmed, otherwise a free flow will not be obtained. The blood is sucked up the pipette to the mark "11," and the contents of the pipette at once blown into a Dreyer's tube and shaken. The whole procedure should be completed within two minutes, otherwise there is danger of the blood in the stem of the pipette clotting. This can easily be done with a little practice. White-cell pipettes usually have a volume of about 0·4 c.cm. and from this 0·2 c.cm. of plasma may be obtained. For the actual estimation 0·05 c.cm. of plasma is used and equal amounts of brain extract and M/40 calcium chloride added. Using these amounts instead of 0·1 c.cm., as in Quick's original method, allows the estimations to be repeated two or three times, and the end-point is clearly seen.

We would like to thank Dr. W. Allen Daley, medical officer of health, L.C.C., for permission to publish this report.

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Reviews of Books

Medicolegal Ophthalmology

By ALBERT C. SNELL, M.D., lecturer in ophthalmology, school of medicine and dentistry, University of Rochester. St. Louis: The C. V. Mosby Co. Pp. 312. 30*s*.

BOOKS of reference on special medical subjects are apt to be written towards the end of a career and therefore to be coloured by the author's particular personal experience in a way which restricts the free use of the text for general reference. This treatise deals with the forensic aspects of ophthalmology from the point of view of industrial disability, a subject which attracts many ophthalmologists in practice, but which may find them relatively unprepared for the mathematical exigencies required by the court before which the extent of impairment of sight is assessed. Dr. Snell deals at length with the percentage evaluation of vision, of visual acuity, and of peripheral vision, and it is in this respect that the book justifies its title. There are sections on the practical application of these subjects to medicolegal situations and an important chapter on malingering. A book confined to the particular applications of a specialty, whatever its excellence, can be of service to only a handful of the medical public. For this reason it seems unnecessary that the author should have given at such length the elementary principles of medical evidence and of ophthalmological practice. The expert for whom the book is intended will be well acquainted with both. Its value to the specialist who occasionally has to assess vision for civil or industrial compensation claims is, however, undeniable.

Synopsis of Obstetrics and Gynæcology

(8th ed.) By ALECK W. BOURNE, M.B. Camb., F.R.C.S., F.R.C.O.G. Bristol: John Wright and Sons. Pp. 490. 15*s*.

FOR nearly 20 years this volume of a well-known series has helped medical students with their revision and has served practitioners for reference. The subject matter is sound and is presented in an unusual but attractive way. Mr. Bourne recommends the use of 6% carbon dioxide as an adjunct in the treatment of fœtal asphyxia, but in view of recent work on the physiology of respiration, and especially on the respiration of the fœtus and newborn child, this advice might be revised. In the section dealing with therapeutic abortion, no reference is made to abdominal hysterotomy. The operation deserves mention because in many of the cases in which therapeutic abortion is indicated it is necessary to sterilise the mother at the same time. The classification of the different types of dysmenorrhœa might be discarded, in view of our increased knowledge of the causes of this symptom. Apart from these three small criticisms the new edition has everything to commend it.

THE LANCET

LONDON: SATURDAY, JUNE 7, 1941

BLOOD-PRESSURE IN SHOCK

EXPERIENCE with air-raid casualties has shown that the various combinations of injury, fear, exposure, hæmorrhage, crushing, burns, multiple fractures, head wounds and other factors, such as delay between injury and treatment, can produce widely different clinical pictures. These call for revision and expansion of the accepted descriptions of what has loosely been termed "shock." Furthermore, our pre-war ideas about shock were largely founded on observations in the restricted age-group of fit young soldiers, whereas the range of clinical material is now much greater. Nowadays the wounded may include the very old and the very young, both sexes, those who were previously diseased or in poor health or frail, and those with a mentality neither trained to, nor at all suitable for, withstanding the terrors of total war.

The chief means of assessing the severity of shock has long been the blood-pressure. This usually reflects the state of a circulation deranged either temporarily by mental stress or pain (often termed primary shock), or more seriously by gross reduction in blood-volume due to hæmorrhage or plasma loss (often termed secondary shock). As between blood loss and plasma loss, the latter is the more serious because of the resulting hæmoconcentration which adds to the circulatory embarrassment. In most cases of wounding an examination that is thorough enough to reveal all sites of injury, combined with clinical observations that include a series of blood-pressure determinations, almost always allows of the separation of those who require transfusion for the restoration of blood-volume from those who will recover with the simple conservative measures of rest, quiet, warmth and a sedative. In all cases the serial blood-pressure readings are essential for assessment and for estimating the response to treatment; they indicate the need for transfusion, the sufficiency of transfusion and the failure of transfusion—e.g., when continuous internal hæmorrhage neutralises the anticipated effect. And yet it is clear from clinical reports that the blood-pressure should not be regarded as either an infallible observation or as the only one that need be made on an injured person exhibiting pallor, cyanosis, sweating and the other signs of circulatory embarrassment commonly put down to shock. It is not sufficiently recognised that this train of symptoms and a bewildering number of terminal states can be produced by at least three different mechanisms: the first a matter of cardiac nervous control, the second arising from circulatory inefficiency due to reduction of blood-volume, and the third representing the terminal stages of tissue dehydration when fluid loss continues and fluid intake is nil. The first of these states can be countered by rest, warmth and a narcotic, the second needs the transfusion of a protein fluid (blood, plasma or serum) for a basic treatment, while the third demands adequate hydration with ample fluids by mouth and saline intravenously.

There is therefore need for much clinical judgment, in addition to mere observations of blood-pressure, for the prescribing of proper treatment for the injured. In general, transfusion is undoubtedly required for those casualties whose wounds leave no doubt about the degree of blood loss, or for those whose blood-pressure remains low or continues to fall despite conservative treatment. But it does not follow that transfusion is unnecessary where the blood-pressure is not low. In the series reported by KEKWICK and his colleagues,[1] there were cases in which the blood-pressure reading by itself would have been fallacious. Thus the hypertensive may suffer a huge loss of blood and yet have a blood-pressure within the accepted normal limits, while the young subject may have so much compensatory vasoconstriction after a large blood loss that, for a time, his blood-pressure remains well above the anticipated level. GRANT [2] also describes this last phenomenon and notes how the pulse is barely palpable despite the high—sometimes abnormally high—brachial blood-pressure. A further difficulty has been introduced by the rediscovery of fat-embolism as a result of the many bony injuries of total war. Here the characteristic signs do not usually develop until the second or third day after injury,[3] but the unwary may be trapped into regarding the condition as "delayed shock." The mental state, the sweating and the general collapse, though the blood-pressure is ordinarily well maintained, may easily suggest the advisability of transfusion; but these are cases in which transfusion can hardly be expected to do good, and will probably do harm. GRANT rightly emphasises the urgent need for accurate, detailed and extensive observations, with an open mind, on the wealth of clinical material now available, so that we may reformulate our ideas on the reactions of the body to injury and clearly define the clinical groups together with their treatment. One thing at least is certain. Blood-transfusion is not a panacea for all the states produced by injury which are classified as shock.

RESEARCH IN THE E.M.S.

EXPERIMENTAL research in times of peace is a steady but slow process. Who cares, if the right answer is obtained, that five years have been spent on the work? But in war, time is everything, and it is imperative that the right questions, and tight ones at that, should be posed. War presents clinical research workers with unexampled material and the chance of collecting a large body of accurate observations. The acumen of the doctors, the resources of the biochemical and pathological laboratories, and the instruments of precision are there; what is difficult is accurate recording. Early and accurate observations of such conditions as shock and the so-called crush syndrome, the effects of transfusion of protein-containing fluids, and bacteriostatic control of recent wounds, are obtained in circumstances which do not allow of leisurely, and therefore careful, record by those who must not only observe but also treat. Experience is universal that if there are to be no lacunæ at vital points in the records there must be a clerk—and preferable a short-hand clerk—at hand to take down the notes from dictation. CABUNCUS on another page has pointed out that expert physi-

1. Kekwick, A., Marriott, H. L., Maycock, W. d'A. and Whitby, L. E. H. *Lancet*, Jan 25, 1941, p. 99.
2. Grant, R. T. *Guy's Hosp. Gaz.* April 19, 1941, p. 90.
3. See Robb-Smith, A. H. T. *Lancet*, Feb. 1, 1941, p. 135; Rowlands R. A. and Wakeley, C. P. G. *Ibid*, April 19, 1941, p. 502.

cians and surgeons are wasting time in copying out hundreds of their own case-notes for the perusal of the Ministry of Pensions. Their real clerical duty—that of collecting, assessing and analysing results of treatment—is delayed and hampered, or even ousted by this hackwork, from which any little typist could relieve them. Indeed the collection and study of records is not even regarded as a part of their service—they do it as a labour of love or not at all. Questionnaires sent out from the ministries become a burden in the absence of clerical help; they are thus often imperfectly filled or find a destination in the waste-paper basket. Yet in the Spanish war, where there was close collaboration between the fighting and the medical services, observations on the distribution and character of wounds, and their fatalities, were of great use in determining the value of particular weapons and particular methods of attack and defence; and thus of considerable value for tactics. Information to be obtained from accurate medical observations may influence the design of aircraft armour, and the types of protection to be used for A.A. guns ashore or afloat, and may throw light on the efficiency of parachute troops and many other things. The M.R.C. does provide to the utmost of its ability the clerical as well as the expert help sought. But is it fully aware of its golden opportunity or sufficiently apprehensive of the vain regret which will inevitably come when it may be said: We had our chance of finding that out and didn't take it? In the E.M.S. it should be possible to present the case for a corps of clerks, with sufficient proof of immediate utility and of direct life-saving value, to induce the Treasury to countenance the expenditure; but cost, in any case, should not put the scheme out of court. Among the educated women now registering there must be many of independent means or needing little remuneration who could and would do this necessary work well. There must be many rejects among conscripts, in C or D class, who though excluded from active field service would not be debarred from such sedentary work; and there are many conscientious objectors who do not fear danger and would willingly work in hospitals exposed to heavy bombardment. It is not the lazy man who needs a clerk: it is the hard-working man who never thinks of the clock or of the week end; and he needs one, not to give him more leisure, but to spare his ability for work which only he can do.

A DIMINISHING MENACE

A REPORT by A. M. KEMAL[1] and his colleagues of the Egyptian ministry of public health on the epidemiology of plague in Egypt serves as a reminder that the disease has long been endemic in that country. When it first reached there is unknown, but the great epidemic in the Roman Empire in the sixth century B.C. is said to have arisen in Egypt. In modern times, however, little was heard of it until the end of the nineteenth century, when infection arrived at the trading ports of Hong-Kong and Canton and was carried by shipping all over the world, reaching Egypt by way of Alexandria. Between 1906 and 1910 more than a thousand cases a year were notified, with a fatality of 58%. Since that time there has been a steady fall, so that in the five years 1936–40 there were only 870 cases, and these largely confined to the Assiut Province on the Upper Nile. The fatality in 1940 was 36·9% for the bubonic type and, as ever, 100% for the septicæmic. In the bubonic cases treatment with sulphapyridine and serum combined held out distinct hopes for the future, there being only 3 deaths among the 37 cases treated in this way.

Plague is normally a disease of rodents, transferred from rodent to rodent by rodent fleas; in default of their normal host, certain rodent fleas may attack man. The position of man is therefore peculiar, in that the disease is invariably acquired by him not by the agency of his own parasites (the human flea) but by that of rodent parasites which normally are unwilling to attack him and only do so when deprived of their own hosts. Only the pneumonic type of the disease spreads from man to man. The chief rodents responsible for human epidemic plague are the grey sewer rat, *Rattus norvegicus*, and the black rat, *R. rattus*. The sewer rat is mainly concerned in the spread of plague epizoötics in rodents; from it the black rat becomes infected and, being a close associate of man, passes the disease on to him. When the sewer rats in the basement of a house die of plague, their infected fleas leave them and attach themselves to the black rats; and on the death of these the fleas seek fresh pabulum and attack, among other animals, man. Thus epidemics of plague in man are invariably preceded for 10–14 days by epizoötics in black rats, and these by epizoötics in grey rats. The finding of rats dead from an unknown cause in endemic areas should thus cause suspicion; and to be forewarned is to be forearmed in this disease.

It has lately been shown that it is not domestic rats alone which are responsible for the maintenance and dissemination of plague. A considerable number of wild rodents in various parts of the world have been found to spread it. These rodents, most of them living in rural or desert places, maintain infection and through their agency and that of their fleas plague may pass across wide tracts of country without coming into contact with man or his attendant rats. Thus plague in a town may spread to the rural rodent population and pass through it over vast tracts of country to reappear in the rat population of another town and thence in man. Trappers and others handling such rodents in the pursuit of furs or food may acquire the disease from them. This type of plague is known as "selvatic"* plague, and constitutes a serious problem in the control of the disease. But however susceptible rats may be, the disease does not necessarily persist in a rat population. If it appears among a moderate-sized rat population early in the plague season a complete outbreak occurs, and the infection then disappears because the surviving rats become so few and so scattered that their infection by fleas becomes impossible. But mere diminution in numbers is not the only factor curtailing rat epizoötics. A strain of rats comparatively resistant to infection may be bred out by a process of natural selection, the susceptible rats dying and the insusceptible surviving and multiplying. This possibly accounts for the disappearance of the disease from certain islands, such as Mauritius.

1. *J. Egypt. publ. Hlth Ass.* January, 1941.

* From the Portuguese word *selva*, a wood or forest, and applied to the wooded plains of the Amazon basin.

Here plague was introduced from India, became endemic and periodically epidemic for many years, and then, unexpectedly, entirely disappeared in 1927 and has not been encountered since. The influence of climate on plague is substantial, and a high saturation deficiency and high temperature have an adverse effect mainly on the fleas and to a lesser extent on the rats themselves. The best climatic conditions for plague are temperatures between 68° and 78° F. and a saturation deficiency of under 0·3 in.; under such conditions the rat flea can flourish, and its power to transmit the infection is greatest. The time of survival of an infected and "blocked" flea—that is, a flea in which stomach and œsophagus are blocked with blood-clot containing *Bacillus pestis*—is reduced under dry hot conditions, and the virulence and number of the plague bacilli in its stomach are also adversely affected. It is thus apparent that the problem of plague is unlikely to attain any prominence in the deserts where our troops are active just now. Plague occurs and will continue to occur in the cities of the Near East and of the Nile delta, but it is well under control. To a disciplined mobile population it should not constitute a menace.

WORKERS IN THE CARDROOM

HOWEVER forbidding the word byssinosis may be the law now recognises it and we must do the same, for the Workmen's Compensation and Benefit (Byssinosis) Act which was passed last November [1] came into force on May 1, and a board has been set up under the chairmanship of Judge E. C. BURGIS to administer its provisions. Byssinosis derives from the Greek word for linen which gives us also byssus for fine flax. As a term for the respiratory disease produced by the inhalation of cotton particles it has been current [2] since 1902, and it was accepted as a distinctive name in 1937 by the departmental committee of the Home Office appointed to report on compensation for cardroom workers, but as we pointed out when the bill was passed [3] the only justification of this replacement of the known by the unknown seems to lie in the fact that it widens the scope of the act, for the disease affects operatives in other parts of the cotton mill and also flax hecklers The disease itself, under the name of "stripper's asthma," was first described (see p. 744) in our columns some eighty years ago by JESSE LEACH, a certifying surgeon under the Factories Act in Heywood mills. He noted that it was a chronic condition of the lungs, the main symptoms being spasmodic cough, tightness in breathing and asthma, and attributed it to the patient's inhalation of dust while cleaning raw cotton in the early stages of spinning. Strippers, grinders, blowing-room operatives, cotton mixers and other cardroom workers are subject to it, whether they are handling high-grade Egyptian or lower grade cottons.

Cotton arrives at a mill in tightly compressed bales weighing 500–750 lb. It contains dirt, sand, seeds, bits of leaf and other foreign material which must all be removed before it is spun. The bales are opened, the mass of cotton broken up, and the foreign matter removed by various machines. These processes fill the air with dust in the cardrooms and blowing-rooms where they are carried out. The cotton is now in a wide lap or mat, its fibres lying in all directions; the next step is to card, or comb, them into line and to remove broken ends and any foreign particles still left among them. This is done by passing the laps between a cylinder and bars of metal, technically known as flats; both cylinder and flats are covered with steel needles, ¼ in. long, bent forward in the direction in which the cylinder moves as it combs the cotton. There are several hundred points to the square inch, and the cylinder and flats become so heavily clogged with waste matter that they have to be cleaned two or three times a day. For this purpose a revolving brush set with similar metal teeth is generally used; it is often covered by a hood connected either to a fan or a pump to suck the dust away. Some mills now use a vacuum stripper which keeps down dust much more effectively than a brush, even one fitted with a hood and suction apparatus. At intervals of a few weeks the teeth on the cylinder and flats become blunted and have to be sharpened with an emery or carborundum wheel; and grinders, like strippers, may acquire cardroom asthma. The dirtier the cotton the greater the liability of workers to the disease. Modern appliances for carrying away dust by suction have greatly improved working conditions, however, and some firms are now installing cylinders fitted with special wire which needs neither stripping nor grinding. There is thus every hope that cases will in time diminish in number or even disappear.

In the meantime men are still being unnecessarily crippled. The usual history is that after working for many years an operative develops a slight cough, which gradually becomes dry or very irritating; this may be accompanied by attacks of breathlessness and shallow breathing, as a rule on Mondays. During the rest of the week the man feels fairly well and for a long time his trouble may be limited to this "Monday fever"; gradually, however, symptoms are experienced later and later in the week, and in time he is wholly incapacitated for work. Breathing becomes laborious and chest deformities follow, the sternum projecting forward and the chest becoming barrel-shaped. The extraordinary muscles of respiration are called into play and the man stands pressing his hands against his thighs to aid his breathing. He loses flesh and his complexion becomes sallow; after long exhausting bouts of coughing he brings up small quantities of sticky glairy sputum. When examined he has signs of chronic bronchitis and emphysema. The Monday attacks may be due to the physical—and possibly also the psychological—effect of resuming work in dusty air after spending much of the week-end out of doors, breathing naturally and deeply. The man tends to go on breathing deeply on returning to the mill on Monday and thus inhales relatively large quantities of irritating dust until his symptomatic shallow breathing is resumed. A few weeks or months away from work may make him feel comparatively fit, but the day he comes back to the mill breathlessness recurs and he may hardly be able to get home unaided. Some patients complain of breathlessness as the only symptom; others are troubled by the intensely irritating cough with at first little, later much, sputum. Adequate masks could, of course, prevent the disease completely, and the Mark IV dust respirator prevents the inhalation

1. See *Lancet*, 1940, **2**, 700. 2. Oliver, T. Dangerous Trades, 1902. 3. *Lancet*, 1940, **2**, 687.

of all dust particles. There is an agreement with the unions that any worker who asks for a respirator should be supplied with one, but Lancastrians dislike wearing masks, it seems, and are not easy to persuade against their will. The departmental committee recommended the use of such respirators only for operatives removing dust from beneath the carding engines or blowing-room machinery. In any case masks must be regarded only as a second line of defence: the best preventive measures should not depend on the coöperation of the worker—the job ought to be safe in itself. The aim is, and should be, to remove all dust at the point of origin by exhaust ventilation, and year by year this becomes more feasible. Chemical research has shown that the husks, fibres and seeds extracted from the cotton contain two ingredients—histamine and a protein—which can produce effects on the respiratory system impeding free air entry. Only in recent years has it been possible, on the industrial history and the clinical and chemical findings, to distinguish card-room asthma from similar lung troubles in elderly people in other occupations; but these several lines of approach offer good hope that the disease will ultimately be wiped out.

Annotations

PREVENTION OF NEONATAL HÆMORRHAGE

KNOWLEDGE of vitamin K and its influence on the prothrombin level in the blood is accumulating; can it yet be applied in obstetrics and pædiatrics so as to eliminate the deaths from hæmorrhage in the early days of life? Last year we summarised current opinion [1] and noted that in the cure of the hæmorrhagic disease of the newborn administration of blood intramuscularly still held the field, though it was already being hinted that prophylactically vitamin K might be given to the mother before labour. That this is the ideal plan and should be routine is strongly suggested by G. P. Bohlender, W. M. Rosenbaum and E. C. Sage.[2] They gave 1 mg. of a vitamin-K analogue (4-amino-2-methyl-1-naphthol hydrochloride) by intravenous injection to fifty mothers before delivery and studied the effects on the prothrombin of the blood of the fifty infants subsequently born. Another fifty pairs—mothers and babies—were similarly investigated as controls. Blood was obtained from the veins; the observers used Quick's method, taking the coagulation-time of oxalated plasma in the presence of excess thromboplastin and calcium to be more or less inversely proportional to the level of prothrombin in the blood. They use the term "prothrombin time" instead of "prothrombin level." The object of prophylaxis was to prevent the great increase in prothrombin time which has been found on the third and fourth day of life in most infants. Their results were dramatic. The babies of the mothers who received vitamin-K analogue gave an average prothrombin time slowly sinking from about 18 seconds in cord blood to 15 seconds in venous blood on the eighth day of life. The control group gave a curve which began and ended at similar levels, but which rose steeply to over 50 seconds on the third and fourth day. The period before delivery that elapsed after giving the vitamin-K preparation did not seem to make much difference. Thus the fifty mothers who received the vitamin-K analogue were divided into two groups, one group receiving the drug 2 hours or less before delivery and the other 2 hours or more. The prothrombin-time curves showed no appreciable difference. In the first group nineteen mothers received the vitamin less than 30 minutes before delivery, two of them receiving injections 5 minutes before and three between 5 and 10 minutes before. The longest time between treatment and delivery was 23 hours 15 minutes. No infant failed to respond, as judged by the prothrombin times. The antepartum use of vitamin-K analogue had no toxic effects on the infants as far as temperature or weight charts showed. There were no cases of hæmorrhage in the fifty babies whose mothers had been treated—nor apparently in the control group, though the numbers are too small for this finding to be significant. If it be accepted that the prothrombin level in the blood is the main factor responsible for bleeding in the newborn, trauma playing a part in some instances, then the case for giving vitamin K to the mother as a prophylactic measure seems well established. It is clear that vitamin K readily passes through the placenta and it is much easier to reach the blood-stream of the infant by this route than by intravenous injection after birth. The fact that the vitamin can be given to the mother late in labour also strengthens the case for its use. If labour lasts more than 24 hours and one injection of the vitamin has already been given it might be wise to repeat it. Bohlender and his colleagues urge that vitamin K should always be used prophylactically when the infant is likely to be premature, when labour is long and when operative delivery of any kind is anticipated. They make out a strong case for giving it prophylactically to all mothers. Intracranial or other hæmorrhage occurring during delivery are unlikely to be influenced, since prothrombin levels are normal at birth; but all other varieties of neonatal hæmorrhage should be prevented by what is a simple and relatively cheap procedure.

1. *Lancet*, 1940, **1**, 650.
2. *J. Amer. med. Ass.* April 19, 1941, p. 1763.

HYPERVENTILATION IN AIRMEN

THE human body is now being called on to fight battles at 30,000 ft., or to resist the gravitational stresses of aerobatics in a modern fighter, and the retina is expected to fulfil the requirements of night interception. The investigation of these problems in aviation medicine call for accurately applied physiology as well as imagination and vision. Lately the effect of hyperventilation on airmen has come up for discussion in America. At high altitudes, where there is a low oxygen tension, over-breathing from oxygen lack is common, and may produce symptoms from alkalæmia. Hinshaw and Boothby [1] suggest that even at low altitudes hyperventilation with symptoms may occur from emotional stress, especially in long and hazardous flights. Hinshaw himself, when extremely anxious about turbulent atmospheric conditions during a flight, felt faint, weak and dizzy. These symptoms continued until tingling and numbness of the fingers began, and it then struck him that quite unconsciously he had increased the rate and depth of his respiration, and that he was experiencing the "hyperventilation syndrome." There is an obvious relationship between emotional and respiratory changes—we have all gasped with pain and seen the hyperpnœa of the hysteric—but Sargant [2] has usefully drawn attention to the sustained hyperventilation which results from anxiety, and has explained on the basis of overbreathing the dizziness, fainting, sensory changes, physical weakness, collapse and even tetany which may develop in extreme anxiety. The phenomenon of "freezing to the controls" which pilots in tight places have noted may thus arise from hyperventilation tetany. Unfortunately the conditions necessary to produce it do not lend themselves to calm and detached observation, and cannot well be reproduced experimentally. Hyperventilation is also caused by the shouting and inspiratory efforts used to oppose centrifugal force during power-diving, bank turns and

1. Hinshaw, H. C. and Boothby, W. M. *Proc. Mayo Clin.* April 2, 1941, p. 211.
2. Sargant, W. *Lancet*, 1940, **1**, 314.

loops. Hinshaw and Boothby quote an instance of a pilot racing over a closed circuit who had been shouting loudly to prevent "blacking out" while making steeply banked turns at the corners and developed symptoms of tetany, including carpopedal spasm. The individual threshold for the hyperventilation syndrome varies enormously, but so does the respiratory response to emotional stress; hence one person may have been imperceptibly overbreathing for a considerable time, and so have placed himself on the verge of symptoms, while another, in similar circumstances, has maintained his usual respiratory rhythm and not disturbed his acid-base balance.[3] Thus in an anxious or constitutionally inferior person the hyperventilation syndrome may arise from a small cause which just tips his acid-base balance, while it may take the stresses of operational flying to produce the same state of affairs in a tough and stable pilot.

SURGERY AND THE COMMON LAW

IN this country, unlike some others, the practice of surgery is not governed by a special code of laws. Anyone who cares to risk an action for negligence may perform any surgical operation he likes—unless it is a dental one or is in itself illegal, such as criminal abortion, or perhaps sterilisation without good reason. The surgeon's actions are governed by the common law, which Mr. Zachary Cope described in an address to the Medico-Legal Society on May 29 as a system which exemplifies to the full the practical common sense of the British race. Surgery as practised today, he declared, creates new combinations of circumstances unknown to our forefathers, and the modern surgeon and his responsibilities have without doubt opened up a new field for the wise development of the common law. One of the features of the administration of common law is that it proceeds by applying broad principles rather than particular rules. In this it is perhaps analogous to clinical medicine; equity is based on an intricate pattern of precise rules and is thus in some sort the counterpart of surgery. The swab case of Mahon *v.* Osborne,[4] in which the Court of Appeal reversed an award of heavy damages against a surgeon, was an excellent example of the manner in which the common law works. At the trial the judge thought he had found, in a short report of an earlier case in a medical journal, a statement by Lord Justice Scrutton of a rule of law that if a doctor puts a swab into a patient he is responsible for taking it out again. The Court of Appeal declared that no such rule exists, and reaffirmed the broad principle that a surgeon, like every other person who performs an action which may harm someone else, must use such skill and care as are reasonable in the circumstances; it is for the jury, or the judge sitting alone, to decide whether in the particular circumstances he did what could reasonably be expected of him. The Court of Appeal found that the judge had not sufficiently directed the jury's attention towards the question of whether the surgeon had or had not done, by personal search and otherwise, all he ought to have done, and ordered a new trial (which has never been applied for). Undoubtedly the verdict, if it had not been reversed, would have caused some perturbation to surgeons. A surgeon has plenty to do and think about besides counting swabs. In every hospital a strict and well-thought out system of checking swabs and instruments is followed at all operations, and the surgeon's view, expressed by Mr. Cope, is that if he receives an assurance from the theatre sister that all the swabs and instruments have been accounted for he may sew up the abdomen and be relieved of responsibility if one remains inside. Nothing is less likely, however, than that the courts of common law will adopt such a rule. There would be no parallel to it. The law of negligence contains rules that in certain general sets of circumstances certain duties may exist, but contains no precise limitations of the duty to take care in a particular set of circumstances like those of a surgical operation. The precautions the surgeon must take to ensure that the swabs are all removed must remain a question of fact in each particular case. No two surgical operations are absolutely alike, especially if they are performed at different hospitals. The Court of Appeal said in Osborne's case that it was reasonable that the surgeon should be allowed to rely to some extent on the theatre sister's count. What that extent is must be for the jury to decide in each case. There is always plenty of evidence of the conditions of the operation, and of the extent to which it was reasonable to expect the surgeon to make a personal search for swabs in the wound. In clearing away the dangerous idea that the surgeon is absolutely liable to take out everything he has put in, regardless of the theatre sister's assurance, the Court of Appeal did surgeons a good turn. The decision bears out Mr. Cope's opinion that the average jury may be trusted to come to a correct decision if the full facts of the case are put before them by the judge. Speaking of the Volkmann's ischæmic contracture case, Tyndall *v.* Alcock, he suggested that the appeal tribunal in surgical cases should have the power to reconsider the facts and to call in impartial independent testimony. Many critics regard the sacrosanct character of a jury's verdict as somewhat unfortunate; when a judge has sat alone the Court of Appeal already has that power of complete revision.

3. See Fowweather, F. S., Davidson, C. L. and Ellis, L. *Brit. med. J.* 1940, **2**, 373.
4. See *Lancet*, 1939, **1**, 242.

THE BLACKCURRANT

James Lind's "Treatise on the Scurvy" published in 1757 included the observations of an Austrian army surgeon that green vegetables and the juice or pulp of orange and lemon were effective cures for scurvy. The antiscorbutic value of citrus fruits was confirmed over and over again and these fruits were always cited as the richest sources of vitamin C. But when this vitamin was identified with ascorbic acid, which could be estimated in the laboratory, it became possible to survey the value of other fruits and vegetables as antiscorbutics. The high vitamin-C content of the English blackcurrant was first demonstrated by Olliver[1] who found that blackcurrants contain on an average 200 mg. of ascorbic acid per 100 g. and are thus 3 or 4 times as potent as orange juice which averages only 50–60 mg. per 100 g. From the point of view of infant feeding however the orange still had the pull over its English rival, for its juice was much easier to dose than the tough-skinned berry of the blackcurrant. The firm of Chivers, in whose laboratories the initial work on the ascorbic-acid content of blackcurrants was carried out, went on to investigate the possibility of preparing a blackcurrant product of high vitamin-C content which would overcome this difficulty. A puree was prepared consisting essentially of finely sieved blackcurrant mixed with sugar, all the coarse cellular tissue being removed. This puree was standardised so that 3 teaspoonsful contained about 25 mg. of ascorbic acid, or rather more than the customary daily dosage of orange juice. Since so much of the vitamin-containing tissue is included, this preparation is probably the most economical way of utilising the vitamin-C content of blackcurrants for infant feeding. Although the cellular tissue in the finished puree is very finely divided, it may be considered advisable in feeding young babies to use the expressed juice only. Work has been carried out along these lines at Long Ashton experimental research station where a clear, sweetened blackcurrant juice of similarly high vitamin-C content has been prepared. The value of such products under existing conditions hardly needs to be emphasised. As we pointed out [2] when the curtailment of imported fruit

1. Olliver, M. *J. Soc. chem. Ind., Lond.* 1936, **55**, 153 T.
2. *Lancet*, 1941, **1**, 48.

came into force, any wholesale restriction in available vitamin C would certainly lead to infantile scurvy. It is fortunate that in the blackcurrant we have a valuable alternative to the orange, and both puree and juice should prove useful. In view of the limited quantity of blackcurrants available the Ministry of Food proposes that a large part of the crop should be used for making such preparations for children, and the Ministry of Health has given the proposal its blessing.

THIS TRIFLE, WAR

WHATEVER its drawbacks, total war is not open to the same eugenic objections as the old-fashioned kind. It has been said of wars in the past that they destroy the cream of the young manhood of a generation; and that the best germ-plasm is thus irrevocably lost, to the lasting detriment of the race. To see men in terms of germ-plasm savours, perhaps, of the biologist's fancy that the hen is merely a device for producing more eggs; but the argument is disturbing for all that. To know that this dysgenic effect is reduced, because the risk is more evenly distributed, is a minor consolation of this war. Raymond Pearl, however, held [3] that no war had so far occurred in the nineteenth or twentieth century which had had any measurable genetic effect on the nations involved. This seems incredible until his figures are studied. He pointed out that wars, nowadays, last only a short time in comparison with the span of human life; and more fighters return than are killed. They return in the prime of life, capable even if maimed of founding healthy families; and most of them do. In the last war those killed formed a startlingly small fraction of the total population. He estimated that the loss to the American race was only 0·055% of the 1910 population, or 0·048% of the 1920 population, and thought it unlikely that any geneticist would regard five one-hundredths of 1% as a significant loss from the total gene pool of the population. The comparable figure for France was, of course, much higher, lying, he calculated, somewhere between 1·4 and 3·4% of the population; yet even so it could have had no measurable effect on the quality of the French race. These figures are worth remembering at the present time, when pressure of war spoils the sense of proportion. Nor is it merely on genetic grounds that they are cheering; they remind that, at worst, wars are minor interruptions of our evolution and that we have a good chance of growing out of them.

ECONOMY IN SPIRIT

THE Government is anxious that as little alcohol as possible should be used for medicinal and surgical purposes. The amount so used at present is said to be "colossal." So far the only direct official intimation of the need to go slow with spirit is contained in the M.R.C. War Memorandum No. 3, which says that aqueous solutions of iodine and other antiseptics should be substituted for alcoholic solutions of iodine "owing to the shortage of alcohol" and notes against the item "alcohol" that "many tinctures can be replaced by concentrated preparations, economy is essential." What is said about the need for economy in medicines applies equally to spirit used in surgery and nursing, and no doubt a pronouncement will be made before long from this aspect. Much of the large amount of spirit used in sterilising instruments could be saved. When dry heat can be applied conveniently it is the perfect means of sterilising instruments made only of steel or glass. If dry heat is not available most instruments can be sterilised by boiling immediately before use. Boiling for two minutes is sufficient unless the presence of spores is suspected, as after operations for gas gangrene when the boiling should be continued for fully five minutes. The old belief that boiling blunts the edges of surgical knives has been shown to have little foundation, but knife edges must be protected from mechanical damage during boiling. Syringe needles should be boiled in a weak solution of sodium carbonate for five minutes; this process is lethal to all types of bacteria including spores. Where instruments must be ready for use they should not be stored in spirit if it can be avoided but should be sterilised by other means and kept dry in covered sterile receptacles or in sterile towels. Alternatively most instruments can be stored in an aqueous antiseptic solution to which borax is added to prevent the steel rusting. In hospitals where this method is employed it is found that steel instruments are free from rust after being kept in the solution for a week or more. This method is not suitable for hypodermic syringes and needles, but the quantity of spirit required in such cases is small. As a general rule, however, syringes and needles, if of rustless steel, should be kept dry after boiling. Thermometers and other glass instruments can be kept in a 1% solution of sodium hypochlorite. If spirit is used at all for drying the surgeon's hands it should be applied economically by means of a dropper or spray, but this use can be avoided altogether if after washing with soap and water for three minutes the hands are dried on a sterile towel before the gloves are put on. An appreciable quantity of spirit is used in swabbing the suture line when stitches are removed after clean operations, and here it can well be replaced by an antiseptic solution, such as liquor antisepticus N.F., or a dusting of sulphanilamide powder. In preparing the patient's skin for operation tincture of iodine can be discarded in favour of washing with soap and water, drying, and painting with a watery solution of iodine or an antiseptic dye. The use of methylated spirit for treating the backs of patients in bed should be restricted to a comparatively small number of clinical conditions such as the neurological diseases in which bedsores are likely to develop. In other cases a dusting powder will as a rule be enough, though for dry skins this may have to be supplemented by gentle massage with a zinc oxide and castor-oil cream. Clearly, then, a great deal of economy could be effected without risk to the patient or much extra trouble for his attendants. This seems to be an opportunity for detailed instructions to the staffs of Service and E.M.S. hospitals.

3. *Amer. J. Sociol.* January, 1941, p. 487.

MR. WINSTON CHURCHILL has become a fellow of the Royal Society under a special statute which provides for the admission of persons whose election would be of signal benefit to their fellowship. The award of two foreign memberships links the society still more closely to the Rockefeller Institute of New York. Dr. JAMES CONANT, a distinguished Harvard biochemist, now president of the university, is on the scientific board of the institute. Dr. KARL LANDSTEINER, formerly in Vienna, joined the staff of the institute in 1922, and in 1930 was awarded the Nobel prize in medicine for his differentiation of human blood-groups. The last war showed the practical importance of his work, and today we are more than ever aware of our debt to him.

Lord Moyne, Secretary of State for the Colonies, has announced that a committee under the chairmanship of Mr. G. H. Hall, parliamentary secretary to the Colonial Office, is to be appointed to examine a plan for the establishment in London of a tropical diseases hospital and centre where clinical research and training, including the training of women in tropical nursing, will be carried out.

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.—At the annual general meeting of this society, held on May 28 with Sir William Willcox in the chair, it was reported that during 1940 a sum of £4642 10*s*. had been distributed to 61 widows and 3 orphans. Enemy action had compelled 4 widows to vacate their homes. The total membership of the society is now 289, of whom 160 are life members. Membership is open to any registered medical practitioner who at the time of his election is resident within a twenty-mile radius of Charing Cross. Particulars from the secretary at 11, Chandos Street, W.1.

Special Articles

THE MILLING ASPECTS OF FORTIFIED FLOUR

BY

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MANY special types of flour are produced—such as Hovis, which makes a bread containing a high proportion of the germ of wheat, similar kinds such as Daren and Vitbe, special brown flours such as Turog, and gluten-enriched products like Procea. But it can be stated broadly that millers make two main types of flour—the normal white flour of commerce which constitutes most of their output, and brown flour approximating to wholemeal. There is also the newly introduced national (85%) flour which has much to be said for it from a nutritional aspect. Rightly or wrongly, however, the main demand of the public is for bread made from white flour. The chief criticism which can be levelled against white bread is its comparative lack of vitamins, and particularly of vitamin B_1, and this is what the Government will correct in its fortified loaf.

ADDITION OF ANEURINE

Thanks to the practical, commercial and financial help of the milling industry it will be possible to add vitamin B_1 to the diet without interfering with the preference of the public for white bread. There is no longer any mystery about vitamin B_1: it is 2-methyl-4-amino-5-amino-methyl pyrimidine coupled with 4-methyl-5-hydroxyethyl-thiazole. This compound, known as aneurine in England and as thiamin in the United States, is being made synthetically in the form of the hydrochloride salt, which is identical with and has the same biological activity as the natural vitamin.

The Government scheme involves the enrichment of each sack (280 lb.) of white flour with 0·2 g. of this synthetic vitamin B_1. The uniform mixing in of 0·2 g. (approximately 1/140 oz.) of a material into over 126,000 g. of flour requires care. A method has been evolved whereby a concentrate of the vitamin can eventually be mixed in at the rate of 1 oz. per sack. The concentrate is made by dissolving 1 oz. of aneurine in water and mixing the solution with a thin batter made by stirring 140 lb. of flour with water. This mixture is spray dried, and the dried product can be incorporated at the rate of 1 oz. per sack to give the necessary 1/140 oz. of the vitamin per sack. Many millers are accustomed to mixing powders into flour at the rate of 1 oz. per sack, but not all mills have the necessary exact mixers to do this, and it may well be that lack of suitable mixers may prove a temporary bottle-neck. In view of the delay which has already occurred in the production of the aneurine, it is hoped that the Government will ensure that a satisfactory supply of suitable and accurate mixers is readily available.

Some authorities do not accept with equanimity the proposed addition of aneurine to white flour, pointing out that the milling process removes the vitamin naturally present and that this has to be expensively replaced by the synthetic product. The other addition involved in the fortification of flour—chalk—cannot be criticised on similar grounds; it is not a replacement of something that was initially present in the wheat and which has been lost in the process of manufacture.

ADDITION OF CHALK

It is proposed to add 8 oz. of chalk (creta præparata) per sack, and this presents no technical difficulties for the miller. But opinion is not unanimous that additional calcium is wanted in the diet or that it is best supplied by the addition of chalk, and it is only natural that millers have not shown much enthusiasm over the suggested addition; it savours too much of the sand-in-sugar business. Two other aspects call for particular attention. In hot weather bread sometimes develops an unpleasant disease known as "rope" owing to the rapid multiplication in the loaf of bacteria of the mesentericus group. Fortunately the presence of acid checks the activity of the causative bacteria and so the trouble can usually be quickly controlled by the inclusion in the dough of vinegar or acid calcium phosphate. But if the flour is to contain an additional 8 oz. of chalk the bread is likely to be less acid than usual and the danger of rope developing may be considerably increased. We are not suggesting that this point has been overlooked by those responsible for advising the Ministry of Food; indeed it is rumoured that bread made from flour containing 8 oz. per sack of chalk has been experimentally inoculated with *Bacillus mesentericus vulgatus* and that the Ministry is satisfied that there is no danger of rope. We have had considerable practical experience of rope in bakehouses, however, and are far from happy; it is hard to produce experimental rope in the laboratory and extremely hard to avoid it under some conditions in commercial practice. It is a pity that this calcium addition, if essential, is not to be made in the form of acid calcium phosphate, which is helpful in bread manufacture and is actually used as an inhibitor of rope.

Moreover, there is some evidence that the addition of calcium carbonate may result in the destruction of some of the aneurine during the baking process. The thiochrome test for vitamin B_1, when performed by experienced operators, gives some idea of the loss of this vitamin in baking. With ordinary white bread the loss is probably under 10%; with brown bread, because it has rather a less acid balance, the destruction is a little higher, probably in the region of 10–15%; when calcium is added this destruction is again increased, amounting in some cases to over 20% loss. Thus the addition of calcium carbonate to flour, while presenting no practical difficulty to the miller, is not quite such a straightforward and obvious step as might be thought.

FORTIFIED FLOUR IN AMERICA

In the United States a different plan is contemplated. Fortification or "enrichment" is not to be compulsory, but if flour has such additions it must be labelled "enriched," and enriched flour must conform to the following specification.

Each pound of flour must contain "not less than 1·66 mg. and not more than 2·5 mg. of vitamin B_1" (that is, 0·47–0·7 of aneurine per sack of 280 lb., a considerably higher quantity than that contemplated in this country), "not less than 1·2 mg. and not more than 1·8 mg. of riboflavin" (where this is coming from is not stated), "not less than 6 mg. and not more than 9 mg. of nicotinic acid or nicotinic acid amide, and not less than 6 mg. and not more than 24 mg. of iron." These are essentials, but there are the following optional additions: "Vitamin D may be added in such quantity that each pound of the finished enriched flour contains not less than 250 U.S.P. units and not more than 1000 U.S.P. units of vitamin D. Calcium may be added in such quantity that each pound of the finished enriched flour contains not less than 500 mg. and not more than 2000 mg. of calcium, except that it may be acidified with monocalcium phosphate irrespective of the minimum limit for calcium herein specified. It may contain not more than 5% by weight of wheat-germ or partly defatted wheat germ."

This presents a complex and difficult problem for all concerned, particularly the miller and the cereal chemist; and most people will be relieved that, so far at any rate, the authorities in England have not followed up "fortification" with the same enthusiasm.

NEW ZEALAND

OBSTETRICS AND GYNÆCOLOGY

PROGRESS is being made towards the establishment of a postgraduate teaching hospital and clinical research centre for the Dominion in obstetrics and gynæcology. The New Zealand Obstetrical and Gynæcological Society (under the New Zealand branch of the British Medical Association) already has a major achievement to its credit: the endowment of the chair of obstetrics and gynæcology in Otago University in 1930. The indefatigable secretary, Dr. Doris Gordon, is again stoking the furnaces. A conference was held in Wellington in December last at which the society, the B.M.A., the Health Department, the Auckland Hospital Board, New Zealand University, Auckland University College, and

many women's organisations were represented. It was agreed that Auckland was the best locus for the proposed hospital centre. At the annual meeting of the society in Auckland this March, the project was carried a step further, and all the local bodies concerned warmly promised coöperation. Negotiations are now in progress with the Health Department. The appointment of a special director of the hospital is foreshadowed, and a strong university element will be in control of the medical side of the hospital. This would represent a new and welcome advance in hospital affairs in Auckland.

SOCIAL SECURITY AND MEDICAL BENEFITS

The clash between the government and the B.M.A. has been heightened in the last few weeks. Only a minority of doctors—about 50 out of 600—are reported to be accepting patients under the social security scheme; many of these 50 practice in country districts. Mr. A. H. Nordmeyer, minister of health, maintains that in time the doctors will come in, and advises the people, especially trade unionists, to demand that doctors take up the scheme. Latterly he has suggested that coercion of the doctors is possible and may need to be resorted to. The B.M.A. spokesmen continue to fling denials at the government, chiefly on the ground that it would be impossible to work the scheme with the present depleted medical personnel. There is no evidence that other and possibly better methods of reorganising medical practice are being investigated.

GENERAL MEDICAL COUNCIL

PRESIDENTIAL ADDRESS

OPENING on Tuesday May 27 the 153rd session of the council Mr. H. L. EASON alluded to the enemy action which had subjected the usual arrangements for the session to a measure of disturbance. The material loss was much less than might have been expected in the circumstances. To our neighbours the Royal Institute of British Architects, he added, we are deeply indebted for the hospitality extended not only to the council but also to its officers and those of the Dental Board. He spoke of the death, since last meeting, of Prof. Robert Howden, who represented the University of Durham 1918–28, and of the illness of the late president, Sir Norman Walker, who had found it necessary to resign his seat as direct representative for Scotland. The translation of Prof. C. G. Lowry to take the place of the late Colonel Thomas Sinclair as Crown nominee for Ireland rendered vacant the representation of Queen's University, Belfast.

RESERVATION OF MEDICAL STUDENTS

In the last war, said the President, the calling up of junior medical students under the successive systems of recruiting gave the council some anxiety, since it promised seriously to affect the supply of newly qualified practitioners in future years. Fortunately in this war the Government have been alive to the necessity of maintaining an adequate supply of medical practitioners, not necessarily for combatant service, but with the longer view of providing for the maintenance of the essential health services of the country in the years immediately following the war. The council will therefore note with satisfaction that in the schedule of reserved occupations as revised in April it is provided that all persons who have been admitted, or duly accepted for admission, as students by recognised medical schools shall be reserved. It is, however, a condition of their reservation that, except in the clinical years, they shall join a senior officers' training corps or an air training squadron, or undertake some alternative form of national service approved by the university authorities, and that their reservation is subject to periodical certification of satisfactory progress in their studies. Medical schools are also to undertake not to admit in ordinary circumstances a quota of students higher than the average entry for the three years preceding the war. It will be possible, therefore, to maintain the supply of medical practitioners at its normal level.

REPLENISHMENT OF THE REGISTER

Meanwhile the Medical Register for 1941 shows that there were 1319 more registered medical practitioners at the end of 1940 than there were at the end of 1939. The number of persons added by registration to the register was 584 less in 1940 than in 1939, but this reduction was primarily due to a fall of 410 in the number of registrations in the Colonial and Foreign lists. The rising tempo of the war is causing a steadily increasing demand for the services of medical men in the Forces, with a corresponding drain upon the supply of practitioners for the needs of the civilian population. With the object of using to the best advantage the professional services of volunteers from the Empire outside the United Kingdom, or from allied or friendly countries, and of friendly refugees from enemy countries, a new order in council, the Medical Register (Temporary Registration) Order, 1941, has been made since the last meeting of this council. Under Defence Regulation 32B and this order the council may register temporarily in the Colonial or Foreign lists of the register practitioners from the following territories:—

(1) The several states and territories of the Commonwealth of Australia, Burma, the several provinces of the Dominion of Canada (to which the Order of 1940 also applied), India, Newfoundland, New Zealand, and the several provinces and territories of the Union of South Africa.

(2) H.M. colonies, protectorates and mandated territories;

(3) Belgium, Czecho-Slovakia, France, Greece, Holland, Norway and Poland; and

(4) Germany and Italy.

The prescribed conditions for registration under this order are:—

(*a*) That the applicant is of good character;

(*b*) That he holds a medical diploma or diplomas, which in any case where he proposes to engage in approved civil employment must be recognised for the time being by the council for the purposes of the order as furnishing a sufficient guarantee of the possession of the requisite knowledge and skill for the efficient practice of medicine, surgery, and midwifery;

(*c*) That he (i) is, or has been selected to serve as, a medical officer holding commissioned or comparable rank in one of the Armed Forces of the Crown or in an Allied or Associated Force; or (ii) is employed, or has been selected for employment, as a medical officer in a hospital, or other institution or service not involving medical attendance on patients in their own homes, which for the time being is approved by the Minister of Health (or in Scotland and Ireland a Secretary of State) for the purposes of the order.

At the end of last week the number registered for the period of the present emergency by virtue of Imperial qualifications granted outside the United Kingdom (which the law obliges us to describe as colonial practitioners) was 44, by virtue of qualifications granted in the United States of America or in Continental countries was 250, of whom 20 were serving in the Forces and 230 were in civil employment.

AMERICAN CONTACTS

More recently Mr. Roosevelt, in response to a telegram sent to the American Red Cross of which he is president, has appealed for 1000 young American doctors to volunteer for professional service either in the Armed Forces of the Crown or in the civilian emergency medical service. As far as my information goes, there has already been a splendid response to this appeal. In the selection of suitable applicants the American Red Cross will have the coöperation of the division of medical sciences of the National Research Council, the American Medical Association, the American College of Physicians, and the American College of Surgeons, to which bodies the qualifications of applicants will be submitted. In view of the evident care with which the credentials of applicants will be investigated it would appear that no difficulty should arise in recognising the diplomas of the selected practitioners as furnishing a sufficient guarantee of the possession of the requisite knowledge and skill for the efficient practice of medicine, surgery, and midwifery.

Another instance of the sympathy of the United States with the difficulties which may beset medical students in schools which have been damaged in air-raids is the offer of the Rockefeller Foundation to provide a two years' course of clinical instruction free of cost in medical schools of repute in the United States or Canada for 25 selected candidates. This offer has been gratefully

accepted, and a committee presided over by the chairman of business will shortly be making the necessary selection from among the applicants. The students so selected will act, so to speak, as student ambassadors to the schools to which they are posted, and it will be for them to uphold the reputation of the medical student body in the United Kingdom. On their return it is to be hoped that they may be able to present us with an interesting survey of medical education in the United States and Canada as seen by the student already familiar with English methods. It is obvious that successful applicants may wish to be assured, before they leave this country, that the studies which they pursue during their two years' absence will be recognised by the licensing bodies here as part of the curriculum. The Chairman of Business and I consulted the executive committee on this point in February, and with their approval intimated to the bodies that the council would raise no difficulty if they saw fit to accord this recognition. A number of bodies have already agreed to do so.

REVISION OF RECIPROCITY

The severance in October of the reciprocal relations between the United Kingdom and Italy to which I alluded in November has set us free to make it known that the view of the law on which an important provision of the Anglo-Italian agreement of 1925 as to professional practice in the two countries was founded has since proved to be mistaken. The point at issue is not easy to explain in simple language, but it may shortly, and I hope accurately, be put as follows.

A territory outside the United Kingdom which wishes to enter into, or remain in, reciprocal relations with the United Kingdom under Part II of the Medical Act, 1886, is required by section 17 to afford such privileges of practising in the territory as to His Majesty may seem just to the practitioners designated by the section as "the registered medical practitioners of the United Kingdom."

Who are these practitioners? The view which in 1925 had prevailed since 1886 was that every practitioner whose name was in the Medical Register was a registered medical practitioner of the United Kingdom. The later, and the authoritative, view is that only practitioners registered by virtue of qualifications granted in the United Kingdom or in Eire are registered medical practitioners of the United Kingdom. That is to say, practitioners registered in the separate lists of colonial practitioners and of foreign practitioners contained in the register in pursuance of section 14 of the Act are not registered medical practitioners of the United Kingdom; and it follows that no territory is required to afford privileges of practising to colonial or to foreign practitioners as a condition of the establishment or maintenance of reciprocal relations between that territory and the United Kingdom.

LAX CERTIFICATION

As in the last war, the organisation of the resources of the nation for the combatant service generally, for the supply of munitions, for the mobilisation and use of labour, for public assistance, and for pensions, gives rise to a host of occasions on which registered medical practitioners are requested to sign certificates of fitness or unfitness for persons under their care. Such medical certificates, to be valid, must by law be signed by registered medical practitioners only, and this trust on the part of the state is dependent upon the maintenance of a reciprocal skill and good faith on the part of the practitioners. The state is accordingly entitled to assume that a certificate signed by a registered medical practitioner is completely reliable and an honest and proper fulfilment of his obligation. Unverified assertions made by the patient himself, personal opinions as to his fitness or unfitness for various forms of service or for particular hours of work, and other statements not founded on a careful examination of the patient immediately before a certificate is given, or supported by ascertained facts or conditions, are not proper material to support a certificate signed by a registered medical practitioner as his testimony to facts within his professional knowledge.

It has recently been made to appear to me by information and evidence received from competent authorities that in a number of instances there has been a relaxation of the vigilance with which such certificates are being signed. I have therefore, after consultation with the penal cases committee, issued on behalf of the council an announcement in the medical press drawing the attention of registered medical practitioners to the terms of the warning notice issued by the council with regard to the granting of medical certificates. The announcement recites the following passage of the notice, which I think it is in the public interest that I should repeat from the chair:—

"Registered medical practitioners are in certain cases bound by law to give, or may be from time to time called upon or requested to give, certificates, notifications, reports, and other documents of a kindred character, signed by them in their professional capacity, for subsequent use either in courts of justice or for administrative purposes.

"Any registered practitioner who shall be shown to have signed or given under his name and authority any such certificate, notification, report, or document of a kindred character, which is untrue, misleading, or improper . . . is liable to have his name erased from the Medical Register."

The announcement also states that the council desires to impress upon practitioners that any such certificates should be granted *only on medical grounds*, and from the practitioner's personal knowledge of the health and physical condition of the applicant, as ascertained by him at the time of granting the certificate. I hope, the President concluded, that the council will approve of the action which has been taken in this important matter.

At the conclusion of the president's address Prof. D. F. Cappell, M.D., representing the University of St. Andrews, was introduced by Dr. D. Campbell, and Prof. W. J. Wilson, M.D., representing the Queen's University of Belfast, by Professor Lowry.

LEPROSY CONTROL

Dr. Edwin Muir, medical secretary of the British Empire Leprosy Relief Association, has gone to take charge for eighteen months of the Chacachacare Leper asylum in Trinidad. Sir Leonard Rogers, F.R.S., who spoke in his place at the annual meeting of the association on May 22, stressed the need to modify the age-long policy of compulsory segregation which leads to the hiding of cases until they are no longer amenable to treatment. Epidemiological studies revealed that 80% of infections arise in the households of leprosy cases, and that 19 out of every 20 infections are derived from prolonged contact with the more infectious skin type, and only 1 from nerve cases. This led to the release of a third of the cases segregated in South Africa as uninfective, and, with the spread of the knowledge that most early cases can be effectually treated in less than two decades, 4500, or two-thirds of the known cases, largely voluntary admissions, have passed through the new kind of agricultural leper colonies in South Africa and been released as no longer infective. In a badly infected area in the humid Southern Sudan over half of the 7075 cases moved to agricultural colonies have also been cleared of all symptoms of active disease. In Nigeria, the most seriously infected of our colonial possessions, within ten years the patients, mostly infectious ones, isolated and treated under a voluntary system in large agricultural colonies, have increased from 2500 to nearly 7000. In British Guiana the government modified their compulsory isolation law to permit early cases to be treated at dispensaries, the first of which were financed by B.E.L.R.A. All this has been achieved through treatment less effective than the association would like, and little progress has been made in the last few years in discovering a curative treatment for all stages of the disease. Hopes were aroused by reports of improved results from the use of certain aniline dyes such as methylene-blue, and of diphtheria toxoids, but they have not been confirmed. A new oil, closely resembling the effective hydnocarpus oil in its chemical formula, is now being tested, and it is on such chemotherapeutic lines that progress is most likely to accrue.

Sir William Peel, chairman of the executive committee, asked for closer coöperation between all parts of the Empire. He thought we should pool our resources and that the richer colonies should contribute to the vital needs of the poorer.

The association should now be addressed at 25, Kidderpore Avenue, London, N.W.3.

CROOKES LABORATORIES inform us that owing to the limitation of glucose, Crookes' Glucose B.D. will now only be sold against a doctor's prescription.

In England Now

A Running Commentary by Peripatetic Correspondents

IT is, of course, a great pity about the College of Surgeons, although I cannot honestly say that I spent the happiest hours of my life there; but I will admit to having received the greatest shock of my life there when I was told I had passed the Conjoint surgery a good nine months before I imagined they would countenance a serious attempt. I can remember, too, dropping in one Wednesday afternoon to see if their library had any good books on anatomy, which was engaging my attention at the time. It was a nice library. I awoke to find that someone had brought me a pot of tea and a plate of Marie biscuits. There was no talk of payment, which was a good thing as I hadn't any money on me. In the museum I asked if Dr. James Mortimer* had been along that week, but it seemed that I had just missed him. Yes, it is a pity about the College. Now, if it had been that Queen Square place what a howl of delight would have resounded throughout the world. It was there, wasn't it, that the gentleman on receiving the Pink Slip shot up a statue or two? I wonder how he is getting on. I've always wanted to meet him.

* * *

It is not easy to see a justification for the B.M.A. suggestion that doctors should raise their fees by 20%. The newspaper in which this item was pointed out to me by a fellow-guest in an hotel gave the paragraph the heading, "You must economise in sickness now," and not, as it would have done in the last war, "Your illness will cost you more." This perfectly proper reaction to the B.M.A.'s inflationary policy is probably not what the B.M.A. intended, unless the association is making a subtle attempt to prevent its members from overwork next winter. A small increase in fees to cover increased expenses, such as car-costs, would be reasonable, but an attempt to catch up with a rising cost of living seems unjustifiable. Has the doctor's cost of living risen since the war? Mine has not. The increase in income-tax and the rise in food and commodity prices have been offset by a reduction in household staff, in food expenditure, and in what my young brother when making out his weekly budget for my father's inspection used to include under "sports"—drink, tobacco, sweets, theatres, holidays, week-ends and clothes. Sherry, books and the children's education remain our only luxuries. The first will be taken from us, for the second there are always the libraries, for the third we shall fight to the last ditch. No doubt the extra 1*s.* 6*d.* next year will be hard to find, but it cannot be the Chancellor's intention that doctors should deliberately increase the patient's cost of living.

* * *

We must go a long way back before we can light on any novelty which has had such a wholesale success as the sulphonamides. Probably the rise of the salicylic-acid derivatives is the nearest example to what is now happening. It is perhaps lucky that they have a depressing effect on the digestion and the spirits, for this makes the public realise that they cannot be used indiscriminately for any odd pain, like aspirin. But sooner or later some less nauseating compound is likely to be found and then it may become difficult to prevent indiscriminate use. While my "dugout" mind was pondering this a flying finger from Heaven smote me, and in a few hours I was passing through my first personal experiences of the use of sulphathiazole. The drug did what was expected of it nobly, thoroughly and promptly; but it also led to the appearance of paraphenomena, or phantasmata, some of which were new to my reading or experience. It is always difficult adequately to describe experiences or phenomena which are strange to men's apprehension, yet the attempt must be made.

The first effect of the drug on me was to balloon me out so that I occupied a far greater space than before. Further, it seemed to divide me into separate spheres of appreciation; there was somewhere or other a more or less solid core which was ME, but external to that, and only united to it by tenuous bonds of information, a shadowy mobile vapour constantly billowing up and back from ME but never merging into ME. External to this again were innumerable weaving lines which were sensitive and prehensile so that not only did the whole mass, the solid more or less central ME, know at once its position in space in relation to other bodies, but it could handle these as it pleased. All this sounds fantastic, but is as nearly accurate as I can make it. A younger colleague of mine who has a similar experience, though from sulphapyridine in place of sulphathiazole, confirms this disassociation, but he would add that his ME was not securely anchored, but a floating or even widely revolving nucleus, like that imagined by Coleridge, in the dream of Kubla Khan, and like that requiring at least the thrice-woven circle to restrain its wanderings. Twenty-four hours later I was beginning to contract, but I was still much larger than I knew I ought to be, and still I had an uneasy sense of prolonged and remote perceptiveness and prehensiveness. Today after a further twenty-four hours I am all but normal. In addition to these phenomena there were the more ordinary manifestations of anorexia, and of waves of physical nausea and—curiously—a deep corneal scar of fifty years' standing which had never bothered me before began to burn and smart, and eventually produced a conjunctival reaction, which in turn is slowly passing.

I am neither a trained psychologist nor a trained chemist, and I imagine that it is between these two that the battle of explanation will join; and it will be, in the Lucretian phrase, sweet to stand safely on the shore and watch the contortions of the combatants. If I had to make a book on the final result all my money would go in support of the chemical faction, for they can practise scientific method in testing their hypotheses, whereas the experimental methods of the psychologists are less perfect, and tend to revert to the confused and esoteric jargon of the alchemist. But surely 400 years ago Ben Jonson foresaw the coming of the sulphonamides.

> "'Tis the secret
> Of nature naturiz'd 'gainst all infections,
> Cures all diseases, coming of all causes;
> A month's grief in a day, a year's in twelve;
> And of what age soever in a month:
> Past all the doses of your drugging doctors."

* * *

The large and representative committee set up to plan the medicine of the future has inaugurated its activities, and I see that attention has already been directed towards the position of the teaching hospitals in the form of a plea for extension of education to the hospitals in general. I should have thought that such a plea demanded no insistence. The wealth of clinical material in the municipal hospitals has long been recognised; failure to utilise it adequately for teaching purposes is continually deplored; and the developing liaison with the staffs of the voluntary hospitals has been gratefully applauded by those responsible for undergraduate instruction. But the provision of material is one thing, the capacity to make full use of it is something very different and I shall be interested to see what proposals are forthcoming, especially as the personnel of the Medical Planning Commission includes several experienced deans and ex-deans of medical schools.

Since I am approaching that state of life which is not far from realising Kipling's description of "time-expired," my activity in the remote future will probably be strictly limited (perhaps as an occasional sop something generously designated "emeritus" may be turned over to me), but in the meantime I can contemplate the general principles, for which a long experience of teaching and examining has given me considerable respect. Some form of state control may quite easily deal with the hospitals—that is merely a matter of official administration and control. But can we assume that the detail of clinical instruction to students will be as easily arranged? Is it merely a matter of £ *s. d.*? I am not so sure. Whole-time professors divorced from all contact with private practice are not best suited to instruct those who have not only to pass examinations but subsequently to practise the healing art. And judging by their contributions to the medical journals, even the most enthusiastic supporters of a state medical service

* Vide "The Hound of the Baskervilles."

recognise that there are essential features for the young to learn which are not in the syllabus or curriculum, such as the courtesies to be extended to his fellow practitioners, and the use but not the abuse of bedside manner. We who have been attached to teaching schools appreciated the kudos which our position in itself conferred. We even supposed at one time that we should derive some financial advantage through the students whom we had taught. The disillusionment which in so many cases has resulted has left us reconciled if not contented, especially if we had a genuine love for medicine and realised that to teach is to learn. But that was all very well for men with a comfortable private income. It hardly looks as if the future can produce enough successors of this type.

* * *

Whether "picking up" or "dropping" potatoes is the more soul-destroying task is a moot point. Dropping is certainly a greater physical effort but, on the other hand, it does not involve that exhausting mental process of classifying each potato picked up from the "cave" as good, bad or fit for seed, which is rather like a modest edition of what one imagines the Day of Judgment will be. When you drop seed potatoes you are expected to bend down and set each tuber firmly in the furrow at a stated interval, usually 18 inches or 2 feet, from its next-door neighbour. After an acre or so of this some backs begin to feel the strain and their owners must either devise a non-bending technique or else fail the country in her hour of need. Now if the potato is merely dropped from the upright position so that it falls some 3 or 4 feet it inevitably trickles downhill and finally comes to rest against its fellow in the row and this will never do, for spacing (as in family planning) is all-important. If it is to be dropped instead of planted it must be dropped in such a way that it does not run, and this is achieved by imparting spin to it. Thus, if the furrow slopes uphill, the potato must be spun from the off, and if downhill, from leg. Agriculturists ignorant of cricket are suitably impressed when they see this done by a master hand. Another method of relieving the monotony of potato dropping is to imagine oneself a Narzee bomber trying to pick out hospitals and churches as represented by small clods or stones. Every objective hit counts one point, but near-misses count nothing. This is essentially a competitive game of skill demanding a high degree of moral integrity in the players. Unlike us, potatoes go green when sunburnt and are then given to the pigs. Later in the year all these infernal potatoes and their vast progeny will have to be dug which is the hardest task of all—in fact, the potato gives nothing but trouble from beginning to end. It is even, I understand, a nuisance in the kitchen.

* * *

We who live in the country are notoriously out of touch with the higher flights of therapeutics, but we are always willing to learn. "All my life, doctor," said an urban lady to me the other day, "I've had a weak throat. In fact as a child they were always expecting it to turn to diphtheria and I had to be fed on spinach." If I had been her doctor I should never have known about the menace hanging over her and might well have precipitated it by my ignorance of the specific.

* * *

We are rather proud of the resuscitation ward at our hospital. After our last blitz a woman came to the porter's lodge and asked to be allowed to visit Mrs. ——, who had been brought in some days earlier as an air-raid casualty. "What ward is she in?" asked the porter on duty. "She was admitted to the resurrection ward," the woman replied; and resenting a curious expression on the porter's face, added, "Yes, and I know what I'm talking about."

* * *

Scottish shepherds have no monopoly of the classical learning. Recently I overheard a conversation between one of our West Country shepherds and a farmer who was bemoaning the lateness of the spring and the bad growing weather.

"Doanee worry, maister," rejoined the shepherd, "'twill be all right presently when Phœby comes." Now Phœby has come and it is all right. The red landscape is rapidly turning green.

Letters to the Editor

"SCIATICA"

SIR,—Many besides myself will be grateful to Dr. Walshe for dealing with Mr. Kellgren's paper on sciatica. I could not make head or tail of it, but I felt that criticism would come better from a neurologist than from me. I should like Dr. Walshe now to come to grips with the orthopædic surgeon, for it seems a pity that there should be so much misunderstanding about the meaning of a word. Dr. Walshe and I think the majority of neurologists would limit the meaning of sciatica to neuritis of the sciatic nerve, which as he says may be recognised by the characteristic signs of peripheral-nerve involvement. On the other hand, many people, of whom I am one, define sciatica as pain in the distribution of the great sciatic nerve or some part of it. This simply means that we regard sciatica as a symptom and not as a disease or a diagnosis. If Dr. Walshe persists in his refusal to recognise this "new sciatica" he will find himself out of touch with a great deal of modern thought and writing on the subject. What, for instance, does he make of sciatica due to prolapsed intervertebral discs, spinal arthritis and other conditions? Nobody pretends that these cases have all the characteristic signs of peripheral-nerve involvement, yet they are called sciatica the world over. Is this all nonsense? I would prefer to think that it is progress, for many of the conditions now described under this heading were unsuspected when the classical description of sciatica was first given.

Sciatica is due to irritation (or inflammation) of some or all of the fibres which go to make up the great sciatic nerve in any part of their course from the spinal cord to the periphery. As in many other affections of the nervous system the investigation of a case of sciatica calls for a topographical as well as a pathological diagnosis. The regions which may be involved are (1) the spinal cord; (2) the nerve-roots; (3) the short trunks of the spinal nerves as they lie in the intervertebral foramina; (4) the lumbosacral plexus on the posterior wall of the pelvis; and (5) the trunk of the great sciatic nerve and its branches.

(1) Sciatic pain is, I believe, not a common symptom of spinal cord disease. But I have met with at least one such case, which was correctly diagnosed by a neurologist.

(2) The symptoms, and particularly the march of symptoms, of a spinal tumour are well known. It is sufficient here to say that if the tumour involves the appropriate nerve-roots the dominant symptom will be sciatica. I have operated on such cases and cured them. In the same category should be placed the prolapse of an intervertebral disc. This is really an extrathecal spinal tumour, or at least a lump, which projects backwards into the spinal canal and makes pressure through the dura on one or other of the spinal nerve-roots. This is an undoubted cause of sciatica; but, in spite of all the cases which have been reported, it is still a relatively uncommon cause. Enthusiasts might note that the incidence is about 3%, which means that for every case of prolapsed disc there are at least 30 cases of sciatica which are not due to prolapsed intervertebral discs. We have now learnt to recognise the type of case in which a prolapsed disc may reasonably be suspected, and we have means of verifying the diagnosis by X-ray examination.

(3) In 1916, or thereabouts, Sicard drew attention to the liability of nerves to irritation or inflammation as they lie in bony canals or foramina. Rather unnecessarily he coined a word, "neurodocitis," to denote this condition. Further, he expressed the view that arthritis of the lateral intervertebral joints is a common cause of "neurodocitis" giving rise, in the case of the lower lumbar and lumbosacral joints, to sciatica. In 1927 Putti (with acknowledgements to Sicard) also drew attention to the frequent association of spinal arthritis and sciatica. Indeed, he went so far as to say that sciatica is synonymous with spinal arthritis. This, of course, is a gross exaggeration. But it must be confessed that the more one sees of sciatica in orthopædic practice the more frequently does one find that it is associated with stiffness of the lumbar spine, spasm of the erector spinæ muscles, pain on forced movements, and more or less evidence of arthritis of the lateral joints in the X-ray pictures. Many of these patients also give a history of previous attacks of "lumbago." I

therefore am one of those who believe that spinal arthritis is really the commonest cause of sciatica.

(4) It is well known that disease, particularly malignant disease, in the pelvis may give rise to severe sciatic pain from involvement of the lumbosacral plexus. Such cases are diagnosed by routine pelvic examination. Here I would like to add that uncomplicated sacro-iliac strain (the commonest cause of pain in the back) is not a cause of sciatica.

(5) Lastly, no-one will deny that neuritis of the sciatic nerve trunk is a cause of sciatica and that it presents all the characteristic signs of peripheral-nerve involvement. Such cases are sometimes cured almost miraculously by an injection into the nerve or more slowly by other local treatment. Nevertheless I believe that this is a comparatively uncommon condition, and that many cases so diagnosed have their origin at a higher level. It is difficult to believe that all cases of sciatic neuritis go to a neurologist, while all cases of spinal arthritis with sciatica go to an orthopædic surgeon.

Dr. Walshe has remarked that this malady (sciatica) has provided the therapist with some of his most difficult and thankless tasks. So also do all textbooks of medicine and neurology lay stress on the obstinacy of sciatica, its protracted course and resistance to treatment, and its liability to recur. This is not my general experience, although to be sure there are some difficult cases. I believe that much of this ill-repute is due to the fact that so often the wrong part of the patient is treated. I have known many cases submitted to prolonged local treatment over the course of the sciatic nerve, while the real seat of the trouble—the lumbar spine—has received no attention. Spinal arthritis is treated by physiotherapy—i.e., radiant heat, massage, exercise, sometimes manipulation, and occasionally epidural injections—in the belief that the same periarticular fibrosis which causes the stiffness of the spine is also responsible for the irritation of the spinal nerves, and in the hope that by relieving the stiffness the sciatica also will be cured. This treatment is often successful, but there are cases in which it fails, and there are others in which the sciatica recurs in successive attacks. I believe it was Putti who first suggested that, *when other means fail*, sciatica can still be cured by "decompression of the intervertebral foramina." This operation, which I call spinal arthrectomy, consists in the removal of the articular facets of the lumbosacral and two lowest intervertebral joints on the affected side. It is not an operation which one wants to do on every old patient with sciatica; but it is an operation which will cure sciatica, provided that the correct diagnosis has been made. I have done it more than 40 times and I have hardly ever known it fail.

Here then is an orthopædic conception of "sciatica." I do not think that Dr. Walshe can call this a "conglomeration of unrelated and obscure conditions." It is true that there are many different and if you like unrelated causes of sciatica, but so are there many different and unrelated causes of spastic paralysis. All I have done is to apply to affections of this (peripheral) nerve tract the same methods of investigation which Dr. Walshe would apply to the case, say, of the pyramidal tract—namely, determine first its course and anatomical relations and then consider the pathological processes which may affect it in any part of its course. I hope that this may appeal to Dr. Walshe's logical mind. At any rate, there is no-one whose candid criticism I should value more.

London, W.1. A. S. BLUNDELL BANKART.

E.M.S.

SIR,—The Emergency Medical Service has been at work for nearly two years now, and perhaps the time has come for a few considered criticisms.

Specialists.—There is urgent need for training more men to deal with traumatic injuries in the plastic, thoracic and neurosurgical units. The open chest, the depressed skull, the mutilated face, cannot be immediately transported to these clinics; so often there are multiple injuries. Jefferson and Northfield groan about the occasional lacerated scalp and the missed associated skull fracture (*Brit. med. J.* May 3 and 10, 1941, pp. 684 and 728). They cannot have seen the filth, the dust and the dirt that covers the buried patient. But they are right in saying that the men who handle these patients must be trained in what to do, and especially what not to do. Surgeons at the casualty centres should be sent for short periods to see and live amid the work of the special units. It is impossible to acquire the technique and learn the difficulties and dangers by merely attending an odd postgraduate course. At present our leading personnel (I can write especially of the thoracic units) drive through savage air-raids to attend different hospitals. It is foolish to risk our limited expert personnel. We would not send our generals to do battle themselves.

E.M.S. and the future.—The name Emergency Medical Service should be altered. Its functions, we can now see, will embrace more than the emergency of war. With all the leading hospitals blitzed it will take at least three years to rebuild them. The life of the E.M.S., it seems, will be a long one, and the sooner it becomes the Royal Civil Medical Service the better, because it will then be able to construct and plan with vision. At present the slightest alterations to a hospital under the E.M.S.—such as changes to a ward—arouse arguments over who is responsible for payment, and whether it is to serve for the war or after the war.

Smaller hospitals.—War has been a great help to these. Through having to keep beds empty for casualties many of them have been freed from debt, and are even enjoying affluence. And yet they have no resident doctors and no whole-time trained surgeons to deal with casualties, while two or three miles away are large, well-equipped E.M.S. hospitals. Such small hospitals take up large numbers of nursing staff, and casualties and other emergencies are often admitted to them while the E.M.S. hospitals, with skilled staff, are standing by. In my opinion some of these minor hospitals should be closed.

Staff personnel.—The interchange of base and acute hospital staffs is not being carried out, and this is not fair to some of the men. The interchange would permit the "front-line" men to see how his cases progress with the line of treatment he adopts. At present he has no idea of the ultimate issue of his cases. It would also promote better understanding and coöperation when the base hospital staff are called on in an emergency to assist the "front-line" hospitals.

Shortage of doctors.—Beside other reasons for shortage, one stands out clearly: too many medical men are doing purely administrative work. Some of the best surgical and medical brains are thus occupied. Medical men are completely untrained in methods of organisation and the difficulties in the distribution of casualties show this a little. A sector officer may be a good surgeon, but that doesn't mean that he can manipulate thousands of beds, nurses, doctors and what-not. Many of the sector officials sit at their desks and attempt to administrate without visiting the hospitals and discussing personally with the surgeons and physicians their difficulties and troubles; most of them have never even seen a casualty station in action, and don't realise that however well it works on paper the maximum number of casualties that two surgeons can deal with in a night is about 30 to 40. Casualties beyond that number should be sent elsewhere or the operating staff should be reinforced.

Secretarial assistance in research.—In Spain, according to Jolly, there was attached to every surgeon an orderly who wrote full dictated notes on the cases. Here with over a thousand beds functioning I can get no secretarial assistance whatever. All the case-sheets of the casualties are sent to the Ministry of Pensions. We ourselves have had to write hundreds of copies of histories of these cases. Such work is time-wasting from a hard-worked surgeon's point of view, and that time could be profitably spent in research. Plaster therapy, local and general sulphonamides, burns and skin grafting are a few of the subjects on which we collect evidence so as to be able to evaluate the newer methods of treatment. Obviously this is work of extreme national importance. The attitude of the E.M.S. is that they are not interested in research. "We, the E.M.S., have special units well equipped. If you like to keep a record of your cases, it is, my boy, very charming of you, but we don't ask it!" It is to the shame of the E.M.S. that they are not lifting a finger to help in compiling such records. Army units are often attached to E.M.S. hospitals; these are well staffed with orderlies who fill in forms or distribute uniforms. They have never been taught the elements of first-aid, they never attend in the theatre, and do not

even unload their own Army ambulances. It might have been thought that in this total war these orderlies could be permitted to attend at least to the secretarial work of the surgeon in the Army section. But that, it seems, is impossible: how could they take orders from a civilian doctor? Why not put the E.M.S. officer in uniform and solve such difficulties? The Army doctor, attached to his regiment in the district, could be attached to the E.M.S. hospital as liaison officer. He could see and visit his own hospitalised patients, and practising the art of applying plasters and dealing with air-raid casualties would serve him well as preparation for sterner issues.

The bombed patient.—"Front-line heroes, whose courage is winning the war," we say. But tinsel flattery is not enough. The soldier, the sailor and the airman have their convalescent homes; the E.M.S. patient has none. To recover after weeks in some primary base hospital, itself being bombed, and then to be hurled back homeless on the mercy of friends or relations is not good enough. The child bombed in an air-raid shelter should not be permitted to return to London to roam the streets and describe how "dead legs were lying about."

Finally, Sir, it is grand to belong to a service where one need not simper ever in serene applause.

CABUNCUS.

THE IMPETIGOCOCCUS

SIR,—In his article on May 24 (p. 683) Dr. Hope Simpson suggests that there is a specific organism, diplococcal in its "natural morphology," which causes impetigo and probably pemphigus neonatorum. (We may for the moment consider the "cause" in the narrow sense of an infecting organism, and omit other ætiological considerations.) The reasons for his suggestion are essentially that he has found such an organism in smears from impetiginous vesicles; that impetigo is a clear-cut clinical and pathological entity, and that it is therefore unreasonable to think that it can be produced by the same sort of organism that causes scarlet fever, for instance; that in epidemics it "breeds true"; and that it can be cured by measures which do not cure "other staphylococcal and streptococcal infections."

The finding of diplococci in smears is interesting, but does not identify the organism. Much more needs to be done, and it is extraordinary that in textbooks of bacteriology and dermatology the bacteriology of impetigo is not mentioned, or is found in the state in which a previous generation left it. In fact, group-A β-hæmolytic streptococci may be grown from swabs taken from the lesions (table I), and, although this does not

TABLE I—HÆMOLYTIC STREPTOCOCCI AND STAPHYLOCOCCI FOUND IN THE LESIONS OF IMPETIGO AND JUVENILE PEMPHIGUS (The bacteriology was done by the E.M.S. Pathological Service.)

Clin. diagnosis	Case No.	β-Hæm. streptococci		*Staph. aureus* found
		Found	Group	
Impetigo	1	+	A	0
	2	+	A	+
	3	+	A	+
	4	+	A	0
	5	+	A	0
	6	+	Not tested	0
	7	0		0
	8	+		0
	9	+		+
	10	+		0
Pemphigus	17	0	..	+
	21	0	..	+
	24	0	..	+
	25	0	..	+
	26	0	..	+

mean that these organisms are the initial cause, their presence has important implications which need investigating. The supposition that hæmolytic streptococci can cause both scarlet fever and impetigo is not inconceivable, bearing in mind the different types of disease caused by tubercle bacilli, and also the changes in affinity for certain tissues that can be produced in some organisms, such as the virus of vaccinia and some strains of pneumococci.

It is true that impetigo and pemphigus neonatorum have recognisable clinical and pathological pictures, but even here there has not often been the careful scrutiny which might explain the part played by nasal and aural discharges, and by labial herpes, in the initiation of impetigo. An allied problem is whether impetigo does always breed true. It usually does, but I remember seeing a family of three children, one of whom had scarlet fever, one purulent otitis media and one impetigo. We have learnt not to wonder at the coincidence of scarlet fever and otitis, but remain dubious about impetigo.

Pemphigus neonatorum certainly does not always breed true. Recently four infants developed pemphigus in the baby room of a maternity department. But they seemed to be only part of a large epidemic of staphylococcal infection, which also caused paronychia and conjunctivitis, and probably styes and rhinitis (table II).

TABLE II—OUTBREAK OF INFECTION IN BABY ROOM OF MATERNITY DEPARTMENT

Case No.	Date	Age	Manifestation of disease					Bacteria cultured
			Pemphigus	Paronychia	Conjunctivitis	Styes	Rhinitis	
11	Mar 27	12 days	..	+	..	..	..	..
12	,, 30	11 ,,	..	..	+	..	..	..
13	Apr. 4	6 ,,	..	+	..	..	..	..
14	,, 4	5 ,,	..	..	+	..	..	..
15	,, 9	8 ,,	..	+	..	..	..	..
16	,, 10	23 yrs.*	..	+	..	+	..	..
17	,, 18	6 days	+	+	..	..	..	*Staph. aureus*
18	,, 18	10 ,,	..	+	..	..	..	..
19	,, 19	7 ,,	..	+	..	..	..	..
	,, 21	9 ,,	+	..	..	..	..	..
	,, 23	11 ,,	..	..	+	..	..	*Staph. aureus and albus*
20	,, 21	8 ,,	..	..	+	..	..	*Staph. aureus*
21	,, 22	6 ,,	+	..	..	..	..	*Staph. aureus*
22	May 3	17 ,,	..	+	..	..	..	..
	Apr. 24	7 ,,	+	+	+	..	..	*Staph. aureus and albus*
23	,, 24	7 ,,	..	+	..	..	+	..

* A nurse.

The fourth contention, that impetigo can be cured by measures which do not affect other staphylococcal and streptococcal infections, is not entirely convincing, as it is rarely possible in these infections to apply medication to the affected area as intimately as in impetigo.

These criticisms are not intended to imply that I think that Dr. Hope Simpson is necessarily wrong in his conclusions. I obviously do not know the circumstances and bacteria which produce impetigo, but here is surely a rich neglected field to be harvested by the bacteriologist and immunologist, and by the clinical epidemiologist. Perhaps it has already been done, but if so the knowledge is not widely appreciated by the medical profession.

Cuckfield, Sussex. PHILIP EVANS.

POSTWAR HOSPITAL SERVICES

SIR,—I think the authors of the special article of May 17 have expressed quite fairly, if somewhat ingenuously, the general trend of opinion among people who have to do with hospitals nowadays. Some measure of state control (the less the better) through regional committees representing the various interests concerned is probably the ultimate solution of a problem created by the failure of the voluntary hospitals to meet the needs of the community. As to the means by which this machinery is to be set up—there's the rub. To discuss it, even in outline, is beyond the scope of a letter.

It is on one of your contributors' ancillary conclusions that I wish to break a lance. They make the ex-cathedra statement that the post of medical superintendent should be abolished. They make no bones about it. He must be put away. I will confess that in the dear days of peace I was such an one myself, and come what may I have no intention of being abolished, even in deference to this weighty opinion; not solely (I hope) because my bread and butter is involved, but as a matter of principle, or policy if you like. It has become increasingly clear that certain people (mainly associated with English voluntary hospitals, I am afraid) consider that medical

superintendents are redundant, because they are normally cross, stupid and obstructive. They are for ever quenching the fire of genius which lights the eye of the young consultant, and by so doing they bar the way to all scientific progress in the hospital. In the main it is sheer nonsense, as everyone is aware who has had experience of both voluntary and municipal hospitals. I shall, however, confine myself to a few observations on the views expressed in the article.

The Dickensian description of a medical superintendent as an overwrought, incompetent Atlas is, I shrewdly suspect, directed at some individual. It is certainly not a true description of the average M.S., who is really quite a decent fellow and one who knows his job. It is not an easy job, God knows, but merely to substitute a layman for a doctor does not make it any easier. On the contrary.

There is no reason in the wide world why a medical man should not have a talent for administration: many do in fact possess it and exercise it in many ways, quite apart from hospital work.

A hospital is a living organism built of three main parts—medical, lay and nursing. I contend that some one person must coördinate the work of these three departments, if friction and overlapping are to be avoided; and it is highly advantageous that that person should have a medical training. Questions affecting the work of the resident and consulting medical staff, contact with general practitioners, the investigation of complaints, and the planning of new departments—all these are properly the concern of the medical administrator. He should have a limited amount of clinical work to do, for the other side will absorb much of his time.

There must be a competent lay officer working under the medical superintendent, but responsible direct to the hospital committee for financial matters. He may be called secretary or steward, the name matters little, but his duties and status must be clearly defined.

It is indeed a quaint conceit that the holding of a responsible post, resident or non-resident, should "tend to a cramped outlook" and make a man "a wary political fencer," afraid of losing his job. To feel that I was less broad-minded than some of those practising the art of clinical medicine and surgery today, would make me alarmed and despondent.

Lastly, all the large Scottish voluntary hospitals have medical superintendents and in my experience they are administered in an extremely efficient manner. This also holds good for the majority of hospitals on the Continent, in Canada and U.S.A. Does the air and soil of England demand something different? It seems odd.

TERRITORIAL.

GASTRIC ACIDITY IN INFANCY

SIR,—I was much interested in Dr. R. A. Miller's article on the gastric acidity of the newborn in the March *Archives of Disease in Childhood*, which you annotated in the *Lancet* of May 10. I feel that the acidity is an unreliable indication of the type of mucosa except when one is dealing with large numbers, and the presence of 3 achlorhydrics among 50 healthy children does not necessarily indicate 3 hypoplastic mucous membranes. On the other hand, the histological finding of atrophic mucosæ in prematures is an arresting fact of rather a different order. The persistence of a partial failure of development in this direction would fall into line with the ideas of the congenital origin of hyperplastic and hypoplastic gastric mucosæ. I think a distinction should be made between a hypoplastic mucous membrane which has a normal histological structure, although subnormal in area and hence devoid of rugæ, &c., and atrophic mucosæ in which the glandular elements have suffered either as the result of degeneration or of chronic inflammation. I have always felt that atrophic mucosa in the stomach and the diseases associated with it should be considered a separate entity altogether from a mere failure of full development.

The idea of a gastrogenic hormone of maternal or placental origin would fit in with the accepted ideas of the hormonal control of the descent and development of the testicles. In some cases undeveloped and undescended testicles can be carried to the normal state by supplying the missing hormone after birth. It would be interesting to supply hormones of pregnancy to hypoplastic stomachs, but I suppose that in adult maturity little could be affected. If only one could know that a child's mucosa was hypoplastic one could supply him with hormones of pregnancy, but it would be even more difficult to persuade the public to agree to routine test-meals on newborn children than diphtheria immunisation. They would be worth while, because those infants with hypoplastic mucosæ would be subject to gastric attacks throughout life and to a risk of carcinoma later on: it is possible that a short course of hormone therapy might carry development to completion and avoid these possible sequelæ.

Harley Street, W.1. HERMON TAYLOR.

ABSORPTION OF BACTERIAL TOXINS

SIR,—May I offer a clinical example of what I consider to be further proof of the fact that absorption of bacterial toxins may be delayed by the immobilisation of a limb in plaster as suggested by Drs. J. M. Barnes and J. Trueta in THE LANCET of May 17?

As a casualty officer last summer I received a child aged 8 years who had suffered a flayed wound of the upper arm in a car accident. She was taken to the operating-theatre within four hours and although the wound involved the radial nerve and muscles of the upper arm the main blood-supply to the limb was intact. After careful repair the surgeon completely encased the whole arm from wrist to shoulder in plaster. The child recovered from the anæsthetic well and passed a very good night. In the morning she complained only of pain in the hand and although the circulation was not impeded the plaster was cut down the flexor aspect. Within two hours the child's condition had deteriorated—she became rapidly unconscious and despite all efforts she died before noon. The wound was clean.

At the time it occurred to me that the loosening of the plaster had released some principle which caused the child to die.

K. M. TOMLINSON.

Parliament

Rations v. Rackets

As in the recent debate in the Commons the Ministry of Food was again criticised with frankness, and defended with reason, when on May 28 in the House of Lords Lord ADDISON deplored the trivial penalties imposed on those who exploit the nation. It was not enough to stiffen the regulations against offenders; when an important article of food—such as onions or oranges—became scarce, the Minister of Food ought to control its distribution. Again, between the fisherman and the housewife there is an expensive hiatus. The present price of milk, he said, was far too high. Though the Perry report had recommended a reduction of ½*d.* a pint within a fortnight the price was put up ½*d.*, not down. Lord DAVIES thought the small gardener should be encouraged to sell his surplus vegetables and Lord LISTOWEL declared the public were being held to ransom for eggs.

Lord WOOLTON, defending, said that in spite of the Hollywoodisms of "racket" and "gang" which flavoured the debate, the great mass of our traders were law-abiding citizens. He congratulated Lord SOUTHWOOD on his able maiden speech, but regretted it had taken an admixture of war and crime to break his silence. There was no lack of desire on the part of the Ministry to deal with law-breakers, and over the whole country there was a network of 1500 food-control committees charged with the duty of prosecuting people who committed offences against the Food Orders. In February of this year these committees instituted 1160 prosecutions; in March 2141 and in April 2300, and of these 95% had been successful. But he agreed that magistrates out of thoughtlessness had sometimes seemed to condone these offences. Loss as well as disgrace should follow conviction of offences against the food laws. Surely the time could not be far distant when the honourable traders of the country would make up their minds to get rid of the destructive parasites and hand over the evidence which was necessary to bring them to justice.

Lord Woolton proposes to bring more foods under control. He hopes that we shall never have to ration bread, but he believes that he will ration milk. He has to start a new system of experimental rationing and that would be full of administrative pitfalls, but he hopes

that his experiments will secure the tolerant good will of Parliament and the public. He would presently try an experiment in rationing eggs, making special provision for children and invalids. There would be no regular weekly ration, but he would try to give everyone the maximum possible ration. Similar schemes would be applied to other commodities in due course. Within a few weeks he hopes to announce a complete control of fish prices and distribution. Lord Woolton added security made a dull story compared with racketeering, but he was thankful to be able to say that we could face the coming months with confidence in the security of our essential food-supplies.

QUESTION TIME

Our National Loaf

Sir ERNEST GRAHAM-LITTLE asked the Parliamentary Secretary to the Ministry of Food what success had attended his efforts to induce the public by advertisement or otherwise to consume the national whole-wheat loaf of 85% extraction, whether he was aware that there was difficulty in obtaining this loaf, and whether, in view of the urgency of the need to save shipping space and to provide bread of a higher nutritive value than the straight-run white flour, he would follow the example of the Union of South Africa, which faced with the same difficulties had recently prohibited the provision of straight-run flour.—Major G. LLOYD GEORGE replied: The output of national wheatmeal has risen steadily during recent weeks, and bakers in many parts of the country report encouraging increases in sales. Members of the public still find difficulty in obtaining supplies in certain districts, but the number of complaints reaching the ministry is decreasing. As regards the last part of the question, the position in South Africa is not the same as in the United Kingdom and, as at present advised, the Minister is not prepared to increase the rate of extraction beyond 75% to which he raised it on April 21.

Exchange of Prisoners

Major-General Sir ALFRED KNOX asked the Secretary of State for Foreign Affairs whether any satisfactory arrangement had yet been come to for the exchange with Germany of prisoners of war unfit for further military service.—Mr. R. A. BUTLER, Under-Secretary for Foreign Affairs, replied: No reply has yet been received from the German Government to the last proposal made by H.M. Government. In the meanwhile, the question of making separate arrangements for the transfer to more suitable places of prisoners of war who are suffering from tuberculosis is being examined in consultation with other governments.

Examination of Returned Prisoners

In answer to a further question, Mr. R. K. LAW, financial secretary to the War Office, said: Details are now being worked out of a scheme by which all returned prisoners of war will be medically examined and treatment made available to those in need of it. Arrangements for the rehabilitation under medical supervision of disabled prisoners of war or any other ex-Service men are being made by the Minister of Pensions and the Minister of Health.

Physiotherapy in E.M.S. Hospitals

General Sir GEORGE JEFFREYS asked the Minister of Health if he was aware that his predecessor stated that it was the policy of his department that every hospital of 300 or more beds should have a properly equipped physiotherapeutic department; that there were hospitals staffed with one or more masseuses acting under the direction of surgeons who had no specialised training in this branch of medicine; that physiotherapists were appointed to the staffs of hospitals only on application being made by the medical superintendent; and if he would give the lead in implementing his predecessor's pledge by directing that physiotherapists be appointed whether the medical superintendent applied or not; and whether any alien physiotherapists had been appointed to posts under the Ministry of Health.—Mr. E. BROWN replied: The policy of advocating the provision of physiotherapeutic departments in all class I hospitals with 300 or more casualty beds was announced in a circular of June 25, 1940. The existing methods of staffing these departments are generally satisfactory. My department have invited hospital authorities to consider the appointment of physiotherapists, but I am satisfied that it would not be wise to insist upon such appointments against the wishes of the clinical staff of the hospital. No alien physiotherapist has yet been appointed to a post under the ministry.

Supply of Saccharin

Captain L. F. PLUGGE asked the Parliamentary Secretary to the Ministry of Food whether there was any shortage of saccharin and what retail prices were regarded by his department as equitable.—Major LLOYD GEORGE replied: The amount of saccharin released to tablet manufacturers is about 20 times the pre-war figure, but there is evidence of an unsatisfied demand in certain localities. The question of regulating retail prices has already been referred to the Central Prices Regulation Committee set up by the Board of Trade to administer the Prices of Goods Act 1939.

Medical News

University of Cambridge

On May 24 the degrees of bachelors of medicine and surgery were conferred by proxy on I. B. Mackay and A. R. P. Ellis.

The Royal Naval Volunteer Reserve officers decoration has been awarded to Surgeon Commander Charles Elliott, D.S.C., M.D. Birm.

In a recent casualty list, Probationary Temp. Surgeon Lieutenant G. H. Dalglish, M.R.C.S., R.N.V.R. and Temp. Surgeon Lieutenant L. D. de Launay, M.R.C.S., R.N.V.R., were posted as wounded or injured, and Temp. Surgeon Lieutenant A. Watt, R.N.V.R. as wounded.

The O.B.E. has been awarded for brave conduct in civil defence to Dr. F. D. Murphy, senior resident surgeon at Fulham Hospital, Hammersmith.

Lieutenant Oliver Ive, M.R.C.S., R.A.M.C., who was serving in the Middle East is reported to have been missing since March.

The annual meeting of the Medical Insurance Agency was held on May 26, with Sir Humphry Rolleston in the chair. The war has caused a serious falling-off in the volume of business and in the surplus profits available for the medical charities, but £1800 was paid to the Royal Medical Benevolent Fund, and £450 to Epsom College Foundation. It was also decided to allocate £514 to increase the endowment of the Squire Sprigge (Girls' Scholarships) Fund. Dame Barrie Lambert, Dr. G. C. Anderson, Dr. J. W. Bone, Dr. John d'Ewart, and Dr. Henry Robinson were re-elected members of the committee of management for a further period of three years.

On Wednesday, June 11, the section of proctology of the Royal Society of Medicine will meet at 5 P.M., when Prof. E. R. Flint, Surgeon Rear-Admiral G. Gordon-Taylor, Dr. Cuthbert Dukes and Mr. C. Naunton Morgan will open a discussion on factors which make for safety in the preoperative and post-operative treatment of carcinoma of the rectum. On June 13, the sections of laryngology and otology will hold a combined meeting at Horton Hospital, Epsom. At 10 A.M. there will be a demonstration of cases by the chest unit, and at 11.30 A.M. a discussion on the relation of rhinology and laryngology to thoracic surgery will be opened by Mr. C. Price Thomas and Mr. F. C. Ormerod. At 2.15 P.M. Mr. V. E. Negus will read a paper on the organisation of the ear, nose and throat department in the Emergency Medical Service, and later visits will be made to the ear, nose and throat department and the department of neuro-syphilis of Horton Hospital.

The annual meeting of the Royal Cripples Hospital, Birmingham, was held on May 28. The average number of available beds has increased from 307 to 334 and of occupied beds from 270 to 286. Some empty beds were retained for casualties but on the whole there has been little interruption of the normal work of the hospital. Forty Belgian civilian orthopædic patients who had been obliged to leave a hospital at Ostend at the time of the German invasion were accommodated at the Woodlands. Half of them have already sufficiently recovered to be billeted out but are still under the supervision of the Belgian matron who accompanied the party. Last autumn Woodlands suffered three direct hits and two night sisters were killed, but no patient was injured, and work was carried on practically without interruption. The work of restoration is to be put in hand as soon as possible; two new wards have been completed since war started, but the rest of the reconstruction programme is held up for the time being.

Obituary

JOHN MORTIMER WATSON

M.A. CAMB., M.R.C.S.; SURGEON LIEUTENANT, R.N.V.R.

Dr. J. M. Watson was the younger son and seventh child of Dr. Henry Watson of Worcester. He was born in 1913 and educated at Epsom College, where he was head of Carr house in his last year. He obtained the de Havilland scholarship and entered Trinity Hall, Cambridge, where he graduated in 1935. Three years later he qualified M.R.C.S. from King's College Hospital and passed in surgery and midwifery in his Cambridge M.B., but he failed in medicine, and the outbreak of war prevented him from taking the examination again. After six months as house-surgeon at the Royal Bucks Hospital in Aylesbury, he returned to King's as a house-officer shortly before the outbreak of war, and it was then that his quality as a doctor first became clear. In the turmoil that followed he was apppointed casualty officer to a new first-aid post at King's where he was responsible to several different authorities, all a little sensitive of their rights. Thanks to his tact and hard work the new department was running perfectly in a few days. He stayed in this post until he received a commission in the Navy and was posted to H.M.S. *Diamond* early last year. Judging by his letters he enjoyed his new life, but he continued to give thought to the post-war problems of medical reconstruction and education which had always interested him. Watson's recreations were walking, swimming, sailing and gardening. He lost his life in the Greek evacuation in April.

WILLIAM BOYD

M.B. GLASG.; SURGEON LIEUTENANT R.N.

Surgeon Lieutenant William Boyd, of Bearsden, Dunbartonshire, who was reported missing last October is now believed to have been killed through enemy action. He was educated at the North Kelvinside School and as a schoolboy he showed unusual versatility. He was an all round athlete and created records in jumping and running, and he was also keenly interested in music and played the cornet and the trumpet in the school orchestra. Bill Boyd — as his friends called him — graduated from Glasgow university in 1932. Although he led a busy life, he found time to help one of his professional colleagues in the work of running the 69th Glasgow Company of the Boys' Brigade. He had already decided to enter general practice, but first he was determined to acquire practical experience in the hospitals, and after holding resident appointments at the Royal Hospital for Sick Children, Glasgow, and at Stobhill Hospital he spent two years at the Dumfries and Galloway Royal Infirmary. Only then did he feel equal to the responsibilities of general practice, and he began by assisting Dr. James Glover at Tadcaster. With his many interests Boyd found it easy to establish friendly relationships with his patients, and it was apparent from the first that he would make an ideal family doctor. It was about this time that he took up photography as a hobby, and it was characteristic of the man that he studied the subject in detail and he showed originality in the treatment of his subjects.

Annan, Glasgow

Boyd entered the Royal Navy in 1937 with the intention of serving for three years before settling down in practice, and before this war began he saw service in operations off the coast of Spain during the Spanish civil war. When his term of service expired in 1940 he applied for an extension of his commission. Thus for nearly four years he worked on destroyers, and for his services at Narvik he was mentioned in dispatches. It was while he was on his way home after this long period of arduous duty that Boyd lost his life through enemy action at sea.

HUGH MARKS

L.R.C.P.I.; TEMPORARY SURGEON LIEUTENANT, R.N.V.R.

Hugh Marks was the only son of the late Hugh Marks and Mrs. E. A. Marks of Randalstown. He was educated at Portora Royal School, Enniskillen, and Queen's College, Belfast. He obtained the licence of the Irish Royal Colleges in 1939 and after serving as R.M.O. at Kidderminster Hospital he volunteered for service with the Royal Navy. Sixteen days after embarking on his first ship it was destroyed by enemy action. He had bartered for youth's diadem the dross of after years.

JAMES FERGUSON HARPER

M.B. GLASG., R.A.F.V.R.

Hamish Harper, who was killed in a flying accident last August, was the younger son of the late Andrew R. Harper, town clerk of Renfrew, and of Mrs. Margaret Harper. He was educated at Glasgow Academy where he played rugger for the 1st XV. He was also a member of the 2nd cricket XI. A promising bat he was one of the few public school boys to make a century at the wicket. Early in life he made up his mind to be a doctor, and as a student at Glasgow University he showed a keen interest in his work. He graduated in 1935 and after holding resident hospital appointments in Glasgow he went as ship's surgeon on a Blue Funnel liner to the West Indies. A year later he made a voyage round the world. These long trips gave him great pleasure, and he was quick to avail himself of their educative value. On returning home he worked for about two years as an assistant in general practice in Perthshire. All who met Harper were attracted by his charm of manner no less than by his professional ability; and his enthusiasm for his work gave rich promise for his career. In January, 1940, he joined the R.A.F.V.R. and was posted to a squadron stationed in the north-east of Scotland. Harper believed that his services as a doctor might on occasion be more valuable if he could pilot a plane. He therefore spent much of his spare time in learning to fly, and it was while he was practising that he had a mishap that resulted in his death. He was 29 years old.

ROBERT HALL

L.R.C.P.E.

Dr. Hall who died on March 29 at his home in Belfast was born in 1861, the younger son of Hugh Hall of Hilltown, co. Down, and received his medical education at Queen's College. He qualified in 1886 and in the same year was appointed to the Belfast Infirmary which he continued faithfully to serve for nearly fifty-five years. By numberless changes which he made during his tenure of office there he brought the hospital up to its present state of efficiency; it appears that he was the first in Ireland to place consumptives in wards apart from the other patients. Diseases of the chest were his special hobby and at the infirmary and the Abbey sanatorium he had wide opportunity for their study. This knowledge he imparted freely to others and Queen's men will not forget his Sunday morning ward-rounds and his informal and intimate teaching. In 1921 he was elected president of the Ulster Medical Society and his address "On some rare and obscure pulmonary and pleural conditions" revealed his enthusiasm, his erudition and his inquiring mind.

In his early days he was an athlete, cricketer and horseman; in later years the bridge-table was his arena. Throughout the long years his unfailing interest in youth seemed to preserve his own, and it is hard to imagine "the Union" without him. His wife, who died in 1929, was the daughter of William Rodgers of Drum, Carnmoney. His sons, Robin and Hugo, are both serving as surgeon-commanders, R.N.V.R.

HARRY OLIPHANT NICHOLSON

M.D. ABERD., F.R.C.P.E.

Dr. Nicholson's death on May 26, at the age of 71, removes one of the last physician-accoucheurs. Second son of Henry Alleyne Nicholson, professor of Natural History in Aberdeen, he studied there and at Edinburgh, graduating in 1891 and taking the Strathcona prize at the M.D. examination. After nine years in practice at Kirkcaldy, he went to Edinburgh, where he remained for the rest of his life, combining general practice with obstetrics. For twenty years he was senior assistant physician to the Royal Maternity Hospital, lecturing to Edinburgh students on clinical obstetrics and examining Aberdeen students in midwifery; he also examined for the Royal College of Physicians of Edinburgh and for the Scottish Midwives Board. He was associated with the New Town Dispensary as physician and later as physician-accoucheur. After his retirement he spent much time in collecting fossils in the hills of Cumberland and he took pride in the fact that his name was associated with several specimens. Dr. Nicholson is survived by his wife, a daughter of Sir Michael Nairn, Bt., a daughter, and two sons, one of whom is a major in the R.A.M.C.

MARY LOUISA GORDON

L.R.C.P.E., L.M.

Dr. Mary Gordon, who died at her home at Crowborough on May 5 at the age of 79, served for ten years as one of H.M. inspectors of prisons and as an assistant inspector of state and certified inebriate reformatories. In both these spheres she came under the influence of Bryan Donkin, and when she retired in 1922 she set out her own view of "Penal Discipline." The subject was topical, for the report of the Prison System Enquiry Committee and the Webbs' book on English Prisons under Local Government had lately appeared. Her condemnation was as unhesitating as theirs, but her criticisms were those of the inside professional rather than the philanthropic outsider. She felt that to apply a uniform method to a heterogenous collection of offenders was ludicrous. At best, given in small doses, she thought, the system had little effect on the prisoners one way or the other, but in its highly specialised developments, such as the convict prison and the Borstal institution, penal discipline could be actively mischievous. The Borstal system, she held, promoted mental repression with a consequent failure of adaptation to life. As alternatives she sponsored the deferred sentence and adequate psychiatric examination of the convicted.

Dr. Gordon was educated at the London School of Medicine for Women and obtained the Scottish conjoint qualification in 1890. Her early interest in the problems of social medicine and the treatment of alcoholism—she contributed the chapter on the inebriate to "Human Derelicts"—prepared her for her life's work. She lived apart and her work, well done, absorbed all her energy; but she often attended the V.D. committee of the Medical Women's Federation where fellow members recall her sincerity and engaging appearance. After her retirement she spent some time in Zürich where contact with the psychology of the Jung school led her to begin to write once more, this time with a wider view of life. She was well read and wrote with easy grace, and in her "Chase of the Wild Goose" she introduced the aristocratic Ladies of Llangollen with due respect and a pretty deference to what they might have felt to be the rather 'mixed' reading public of our more democratic day.

Dr. JOHN MICHAEL DEWAR, who died in Edinburgh on May 24, bore his father's name and followed his footsteps as a general physician. Since the outbreak of war, despite failing health, he had been acting as assistant physician to out-patients at the Royal Infirmary, where he showed himself a careful and kindly consultant and a pleasant and coöperative colleague. A great lover of birds, he was a fellow of the Royal Society of Edinburgh and a member of several Scottish ornithological societies; he published his own observations under the title "The Bird as a Diver." Dr. Dewar was 58 years old and unmarried.

Public Health

From the Annual Reports

GLASGOW

Glasgow has the largest population of any city of Britain outside London, though Birmingham runs it close. The estimated population in mid-1939 was 1,128,473. It is increasing slightly, but the excess of births over deaths is greater than the recorded increase of population, so there is some migration from the city. In 1939 the birth-rate was 19·2 and the death-rate 13·3, both low records. The most interesting matter in Dr. Macgregor's report is the fall of deaths from pneumonia to 857 compared with 1158 in 1938 and 1543 in 1939. Previous to the last year the average death roll was about 2000. The reduction of the pneumonia mortality to two-fifths of what it was until quite recently is of special interest, for Glasgow has made determined efforts to reduce it. In England little attention has been given to the epidemiology of the pneumonias, but the Scots have studied it closely for many years. Pneumonia kills more of us than all other infections put together, so that even a slight reduction of its mortality saves more lives than the total elimination of most infectious diseases, and the Scots and Americans have shown that there are promising lines of prevention. The sulphonamides have, of course, done much to avert fatality from the epidemic forms of pneumonia, and with further research will do more.

The number of notifications of ophthalmia neonatorum in Glasgow was 713 in 1939. A bacteriological examination was made in every case and the gonococcus found in 16 only. Dr. Macgregor notes that the treatment of gonorrhœal ophthalmia with M. & B. 693 is highly satisfactory and reduced the average stay in hospital from eight weeks to ten days.

FINSBURY

Dr. Blyth Brook's report is cut down to eight pages of typescript. In this metropolitan borough the population density is 96 persons per acre and the house density 6·2 per house. There was no maternal mortality in 687 births. Infant mortality was 33·5. Finsbury is one of the London boroughs with a low illegitimacy rate. In 1939 there were only 38 illegitimates, but their mortality was high—131·5 per 1000.

From the School Reports

Dr. John Allen reports that in *Taunton* 1611 of 3212 children on the elementary-school roll, of whom 13·5% were subnormally nourished were routine inspected. Special inspections and reinspections totalled 10,238. Head inspections by school nurses averaged five per head and revealed 103 individual heads verminous. The dentists inspected 3074 mouths, found 2445 to require treatment, and treated 1430. Of permanent teeth, 1968 were filled and 2107 extracted.

Dr. St. Clair Stockwell reports that in *Leeds* the number of children on the school roll has been shrinking at the rate of 1000–1200 a year for some years. In 1940 the number receiving state-aided education was 58,528, of whom 51,544 were on the elementary-school roll. The total number of all inspections made was 62,659. Of those routine inspected 11·1% were subnormally nourished. Of 33,075 children dentally inspected 27,802 required treatment and 18,921 were treated; of permanent teeth 16,892 were filled and 6926 extracted. Head inspections by school nurses averaged about three per child and disclosed 8790 individual heads verminous.

Dr. Metcalfe Brown reports that in *Middlesbrough* the number of children on the elementary-school roll was 20,213. Statistics for the town are incomplete, but altogether 63,134 inspections were made. Head inspections by school nurses totalled 103,253.

Dr. John Fenton reports in *Eastbourne* that of 4911 children dentally inspected 3473 required treatment, of

whom 1947 were treated; 1433 permanent teeth were filled and 671 extracted. Of all the children inspected 7·16% were subnormally nourished. The school nurses made 30,107 head inspections and found 562 individual children verminous.

These figures from four typical English towns serve to draw attention to the three most frequent supplementary causes of ill health of our children, the control of which is far from satisfactory. None of them is directly in the province of medicine though all are vitally important in maintaining health, and we may justly complain that so long as people are allowed to be ill-fed and verminous and to have foul mouths we are not given a square deal in guarding their health. Whether or not dental caries is theoretically preventable with our present knowledge of its causes, it is certain that there has been no improvement in the extent of the disease, so we must rely on dentistry to render mouths healthy. Health requires our mouths to be not only clean but to contain serviceable teeth, so that the essence of school dentistry is to render mouths healthy by filling permanent teeth. This calls for frequent inspections throughout the school life and no delay in stopping cavities immediately they are detected. The school service alone cannot eradicate the head louse; it can and does keep the heads of school-children reasonably free from lice, but a national drive against lousiness in all sections of the community is necessary. To ensure absence of malnutrition due to ill-feeding some system of rationing offers promise, for reports so far received suggest that the rationing necessitated by war, in spite of its being restrictive, has actually improved the nutrition of the people. A midday meal in all schools as a part of education is an attractive proposition. Continuous education in healthy habits of living from early infancy would probably succeed in the 95% of children who are educable, but lessons on hygiene given to older scholars by people who know little about it, or are ignorant of teaching, are futile.

Infectious Disease in England and Wales

WEEK ENDED MAY 24

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1106; whooping-cough, 4242; diphtheria, 943; enteric fever, 53; measles (excluding rubella), 13,400; pneumonia (primary or influenzal), 1224; puerperal pyrexia, 124; cerebrospinal fever, 274; poliomyelitis, 4; polio-encephalitis, 0; encephalitis lethargica, 6; dysentery, 95; ophthalmia neonatorum, 86. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on May 21 was 1818, including: scarlet fever, 222; diphtheria, 331; measles, 403; whooping-cough, 440; enteritis, 16; chicken-pox, 74; erysipelas, 55; mumps, 7; poliomyelitis, 2; dysentery, 30; cerebrospinal fever, 46; puerperal sepsis, 6; enteric fevers, 9; german measles, 15; malaria, 2; other diseases (non-infectious), 50; not yet diagnosed, 110.

Deaths.—In 126 great towns there was no death from smallpox or scarlet fever, 1 (0) from enteric fever, 22 (1) from whooping-cough, 12 (1) from measles, 25 (2) from diphtheria, 35 (1) from diarrhœa and enteritis under 2 years, and 26 (4) from influenza. The figures in parentheses are those for London itself.

West Bromwich reported the fatal case of enteric fever. There were 5 deaths from whooping-cough at Liverpool, and in the same week Glasgow reported 7. Liverpool also had 6 deaths from diphtheria.

The number of stillbirths notified during the week was 210 (corresponding to a rate of 40 per thousand total births), including 16 in London.

WATSON & SONS (Electro-Medical) Ltd. have lately put a new portable X-ray apparatus (MX 2) on the market. It has a bigger output and is heavier than their earlier portable model, the MX 1. The new machine has a rating of 80 kV and 15 mA. It may be operated from A.C. supplies from 52 to 250 volts, adjustment being simple and rapid. Its total weight is 210 lb., and the whole machinery packs into four cases which may be carried in the back of a small car and assembled in about three minutes. It is fitted with a Machlett tube of 1·5 mm. focus and there is very little restriction on continuity of use. The apparatus is truly portable as opposed to being merely mobile, for it may be carried and set up wherever there is suitable electrical power.

Notes, Comments and Abstracts

NON-INFECTIVE CATARRH

BY A. J. COPELAND, M.D. Camb., B.Sc. Glasg., D.P.H.

IF, from the group of complaints variously called common cold, coryza, febrile catarrh, respiratory catarrh, acute rhinitis and clinical influenza we collect cases of sore dry nares and sore dry cough, early and afebrile, we shall separate, I suggest, a clinical entity, which we can call non-infective catarrh. Catarrh is an expressive word which by its very sound suggests something rough or raw, and its victims themselves say "My chest feels like a piece of raw beefsteak." Feverish cases, and especially those with constitutional symptoms, are excluded, but we may include in the non-infective category cases with nasal discharge, if the discharge contains nothing more than the usual bacterial flora in no excessive amount. The rest of the rhino-pharyngo-laryngo-tracheo-broncho-œsophageal band-waggon may be arranged thus, in increasing order of severity. 1. Infective catarrh—feverish colds, with sneezing. 2. Generalised infective catarrh—similar but with suffused conjunctivæ and pains in the limbs and back, followed by lassitude, without influenza virus. 3. Influenza—similar to the last, but with prostration and more serious symptoms of toxæmia, such as cyanosis, delirium or semi-coma, with influenza virus. The new labels "influenza A" and "influenza B" (there are more to come) cannot yet be applied clinically, however satisfying they may be to pathologists.

I make a sharp distinction between non-infective and infective catarrh. The latter is spread by infected droplets, and the former is thought, I believe often wrongly, to be merely an initial stage of the same complaint; when it stops short the patient is thought to have escaped through natural or acquired immunity. There often is a short phase in such a direct infection indistinguishable from the non-infective condition; but this does not mean that infection is the only road to catarrh. I suggest that in a great number of cases infection plays no part whatsoever: the cause is not bacteriological. I am not discussing here the cases of dry catarrh due to known irritants—such as acids, alkalis, poison gas or tobacco.

The 100% infection theory, which has been accepted by all the physicians of this century (the older school explained dry catarrh very well without it) presents us with some ætiological inconsistencies. First, catarrh had formerly (in popular estimation and in the views of the faculty) been associated with chill, with night air, and especially with the chilly months—with the raw weather and east winds of January and February. Yet it was not found in dwellers in cold high mountain air, nor in Arctic explorers. This is put forward as an argument that chill drives people into close atmospheres, where they become infected. Leonard Hill,[1] however, has told us that catarrh was not found among soldiers in the trenches in the last war, yet they must have been both chilled and crowded in dugouts. The same difficulty arises in explaining the reputed immunity of sailors at sea, for submarine crews on patrol and the crowded mess-decks of battleships are also fairly immune.

Next, catarrh is said to be associated with warm rooms, especially if they are ill-ventilated and crowded; such conditions, it is thought, favour an unhealthy swollen relaxation of the nasal mucosa and make it more susceptible to infection by carriers. Yet heated solaria are not unsafe, warm sunshine is beneficial, and the traveller in the tropics, like his Arctic colleague, seems happily free from this reminder of home. Then, as in January, 1939, many widespread epidemics of catarrh may arise at the same time, with explosive suddenness, especially in barracks, ships in estuaries, public schools and hospitals. Such epidemics, although resembling influenza (without prostration), are without known virus, and no bacteriological cause can be assigned for them, unless it be some undiscovered virus. "In the earlier stages of the common cold," says Douthwaite, "the upper reaches of the mucous membrane may be

1. Hill, L. *Lancet*, 1940, **2**, 796.

sterile." A sterile epidemic is not easily explained by the carrier and droplet-infection hypothesis (the 100% infection theory); some much more universal fulminating cause seems to be at work. Not only did it act like lightning over a wide area but it caused signs and symptoms, especially husky voice, aphonia, cough and pains in the chest, closely resembling those of catarrh caused by the inhalation of weak poison gas (e.g., one part of mustard gas (H) vapour per million parts of air inhaled for an hour); yet atmospheric contamination by irritants could surely be wholly excluded.

In the 1939 epidemic (Stuart Harris et al.[2]), out of 16 large foci investigated, 8 were in barracks and ships, 6 in public schools, 2 in hospitals. It seems reasonable to exclude faulty hygiene, insufficient clothing, lack of good mixed diet, close bedrooms, vitiated atmosphere and overcrowding in the services, public schools and nurses' quarters; but if the assumption seems too great, one or more of these factors should have acted earlier in the winter. I think it is more significant that 9 of the 16 foci were in the neighbourhood of estuaries, and I suggest that there is an irritant operating in January and February from the Mersey to Southampton Water, and from the Medway to the Wash (but not from Spitzbergen to Ecuador): a certain type of British winter weather. I think too that in a large proportion of cases of non-infective catarrh the changes in the mucous membrane arise only from chilling. The explanation cannot lie merely in the chill of cold atmospheric gases—although one naturally thinks of the irritation caused by cold pure oxygen—because Arctic and icy mountain airs are harmless; it must therefore be the cold atmosphere plus water vapour which is harmful. It would be idle to speculate on the precise physical reactions which might occur between cold vapour, or cold mist, and the warm delicate mucosa, but the pathological changes are the same as those seen after exposure to weak irritant gases or in mild burns, where there is no question of bacterial infection; and, as with gassing and burns, non-infective catarrh may either persist as long as the irritant is being applied, resolve, or become auto-infected or cross-infected. The theory of chilling by cold water vapour explains the difficulties as follows:—

Factors favouring development of catarrh

1. January and February: the months of cold wet weather.
2. Estuaries: air saturated with cold vapour; cold mists.
3. Night air: no sun, cold water vapour, mists when the air is still.
4. Barracks and public schools: extreme ventilation practised as a ritual especially in dormitories.
5. Sterile epidemics explained by widespread atmospheric causes.

Factors adverse to development of catarrh

1. Arctic air: cold and dry.
2. High altitudes: also cold and dry; at 25,000 ft. vapour pressure is 1/12 that at sea level.
3. Life in ships at sea (crowded quarters and hot engine-rooms should favour infection).
4. Life in the trenches (crowded dugouts should favour infection).
5. Sleeping in the open air: possibly the sleepers became inured to irritating vapour (as tobacco and snuff users become inured to irritants).
6. Solaria, tropics: sunshine warms vapours and mists.

Doubtful factors

1. Overheated rooms: seem to be a factor in towns, but not in ships, submarines or the hot rooms of Turkish baths. Possibly a congested mucosa is more susceptible to irritation; thus the sudden chill of going into the cold night air may play a part.
2. Overcrowded rooms. Body odours are non-irritant, and carriers cannot convey a sterile complaint. No severe epidemics have arisen in the overcrowded shelters. Sneezing of infected mucus by a patient with infective catarrh would, of course, cause spread; and the initial dry stage of the infection might be confused with non-infective catarrh.

PREVENTION

If the theory of chilling by damp air was confirmed by experiment our preventive measures would have to be modified. At present we concentrate on avoiding, catching and killing organisms, and extreme ventilation is believed not only to be harmless but to sterilise the air and to harden those exposed to it. The first essential is a team research, carried out in a suitable locality and at the right time of year—Liverpool in January would be suitable. The team should include a meteorologist, a bacteriologist and a clinical observer with a knowledge of oto-rhino-laryngology. There is no need, however, to wait for this, or even for the results of experimental work, because we can modify, for the months of January and February only, the precepts of extreme ventilation and exposure which have given admirable results in other climates and even here in other months. This does not mean a shut-window policy, but only warmth combined with moderate ventilation. In other words, we should protect ourselves against wet cold as we protect ourselves against extreme sunshine.

It seems strange that surgeons take pains to ordain the minutest details of the environment of a patient during an operation, but hand him over, as soon as their work is done, to an environment not under their control. A patient goes to hospital for an operation—herniotomy, let us say—and is allocated to a bed immediately under the ward windows, and he becomes mysteriously infected with pneumococci. There is no reason why wards should have windows that open at all: they should be air conditioned like modern state-rooms in liners, with the balcony as a prescribed treatment. It seems illogical for physicians to regulate diet, exercise, special treatment and drugs, and then, even in cases of pulmonary disease, allow the nursing staff a free hand in the regulation of ventilation.

The time will come, I hope, when we shall all take more interest in the general principles of climatology and meteorology, and particularly in the weather of our own localities. As things are, although many observations are taken, they are kept in the records of the health offices, and quoted only in annual reports. They could be valuably used for making local forecasts, and for the information of a central weather therapeutic bureau. Our object should be to make the fullest use of the sunny days for the greatest number, and to guard them, as far as possible, against the bad effects of the worst days, and their sequelæ.

SUMMARY

A form of non-infective catarrh, "epidemic" in wet cold months, is differentiated from common colds and ascribed to the irritation of very cold water vapour in the air.

The damaged mucosa is liable to auto-infection or cross-infection, thus developing one of the various kinds of infective catarrh.

Avoiding, excluding or modifying the causative irritant will prevent the condition.

2. Stuart Harris and others, *Ibid*, 1940, **1**, 205.

COARCTATION OF THE AORTA

STENOSIS of the isthmus of the aorta, first reported by Morgagni in 1760, is the subject of a paper by Montesano.[1] Such coarctation has been observed either in the newborn, when it is congenital and usually associated with other malformations incompatible with life, or in adults as an acquired lesion, when it is thought to be due to spread of fibrosis to the aortic wall during retraction of the ductus arteriosus in the process of its transformation into a fibrous cord. In the congenital cases the stenosis is situated slightly proximal to the opening of the ductus arteriosus, exactly corresponding to the isthmus; in the acquired cases it corresponds to the opening of the duct. The narrowing may be of any grade, up to complete obliteration of the aorta at this point. In the congenital cases the ductus arteriosus remains patent, in the acquired cases it is reduced to a fibrous cord. Coarctation usually gives rise to no symptoms and is accidentally discovered during medical examination or at autopsy. In some cases it is associated with incomplete development of the collateral circulation, and circulatory disturbances in the lower limbs have been described. The case reported by Montesano illustrates the characteristic clinical features of the adult type. An unmarried woman of 22 complained of nervousness, depression and anorexia since

1. Montesano, J. *Rev. sud-amer.* 1941, **24**, 65–129.

the death of her father 5 years before. Routine physical examination elicited the following signs: numerous palpable pulsating arteries on the chest wall, both back and front; a systolic thrill over the lower sternum and also behind, between the midline and the inner edge of the left scapula; a normal area of cardiac dullness; and, on auscultation, a harsh systolic murmur and a soft diastolic murmur. The diastolic murmur was heard only over the xiphisternum, but the systolic murmur was audible over a wide area extending from the epigastrium, where it was loudest, up and to the right, over the right shoulder, and down the back between the vertebral column and the inner edge of the left scapula. The blood-pressure was decidedly higher in the arms than in the legs (215/70 and 217/75 mm. Hg, as compared with 130/69 and 112/68); the pulses in the dorsalis pedis arteries were felt with difficulty. Radiography of the chest showed erosion or grooving of the ribs, caused by dilatation of the intercostal arteries. The heart was slightly enlarged.

THE CARDROOM EIGHTY YEARS AGO

THE first account of cardroom asthma or byssinosis (discussed in a leading article) appeared in THE LANCET in 1863 (2, 648). The writer, Jesse Leach, was a certifying surgeon under the Factories Act at Heywood Mills, Lancashire; his description has the vigour of medical writing of the period.

The following remarks more particularly apply to operatives working in low, narrow, ill-ventilated rooms, where Surat cotton is used.

The first process the raw cotton undergoes is the mixing of one staple with another. Much dirt and dust is disengaged in this operation. The respiration is affected from the dust irritating the respiratory passages of the mixers, and coughing and sneezing are the frequent consequences, which disengage from the bronchial membrane a quantity of slaty-coloured expectoration, which, when placed under the microscope, is seen to consist of very fine short fibres of cotton in air-bubbles and mucus. The sneezing is occasioned by the same material irritating the olfactory nerves during nasal breathing. The arms and hands of the mixers are not infrequently affected with a cutaneous rash, much resembling nettle rash. This may partly arise from fine sand and short fibres of cotton destroying the epidermis, and irritating by their presence the true skin. Their complexion is pale and sickly. After passing from the mixers, the cotton passes through the hands of the willowers and scutchers. When ventilation is not assisted by ventilating chimneys of tin or wood, which take off more effectually the dense atmosphere with which these rooms are charged, the willowers and scutchers suffer in the same manner as the cotton mixers. From the immense velocity of the machines used, the revolutions being 1500 per minute, the quantity of short fibres of cotton set afloat in these rooms is very great. It would be difficult to recognise a man at twelve yards' distance, from the density of the floating fibres, modified, of course, very much by a wet or dry day. The strippers, grinders, and card-room hands are engaged in the next process of cotton manufacture. They mostly suffer from a spasmodic cough, sore-throat, expectoration of blood, pneumonia, and confirmed asthma, with oppression of the chest.

NASTY MEDICINE.—Mr. Henry P. Crocker, of Windsor, Ontario, advises that nauseous medicines should be taken through a straw, placed well to the back of the mouth. In this way, he says, "medicine will be no more unpleasant to take than drinking water." This old trick is mentioned in most textbooks on therapeutic nursing, but it is not always completely successful, partly because the gustatory nerve-endings extend to the pillars of the fauces, the pharyngeal wall and even the epiglottis, and partly because it is difficult to prevent a little of the medicine reaching the tongue when the head assumes its normal posture.

ALLEN & HANBURYS have installed the necessary machinery to manufacture Michel skin clips which were originally made in France and afterwards in Germany. The material Allen & Hanburys are using is the same as that of the French clips, and all sizes, 12, 14, 16 and 18 mm., are available. They are also making Kifa skin clips, an improved version of the Michel clips, which were originally of German manufacture, although marketed by a Swedish house.

Appointments

BURKE, ROSALIE, M.R.C.S.: temp. asst. M.O. (maternity and child welfare) for Coventry.
CLARK, WILLIAM, M.B. Glasg., D.P.H.: district tuberculosis M.O. for co. Durham
COHEN, BEN, M.B. Glasg.: registrar at the Central London Throat, Nose and Ear Hospital.
FREER, J. L., L.M.S.S.A., D.M.R.E.: hon. radiologist to Lincoln County Hospital, Lincoln.
GOLDSTONE, B. W., M.B. Lond., F.R.C.S.E.: R.S.O. at Addenbrooke's Hospital, Cambridge.
LATTO, CONRAD, M.B. Edin., F.R.C.S.E.: R.S.O. at Prince of Wales Hospital, Plymouth.
SMITH, HAROLD, M.D. Western Ontario F.R.C.S.E.: R.S.O. Beckett Hospital, Barnsley.
STANSFELD, AILEEN, M.B. Birm., D.P.H.: temp. asst. school M.O. for Northampton.
WESTWATER, J. S., M.D. Edin., D.P.H.: M.O. to the Department of Health for Scotland.

Births, Marriages and Deaths

BIRTHS

BARLOW.—On June 1, at Harpenden, Herts, the wife of Mr. Donald Barlow, M.S.—a daughter.
GOTLA.—On May 30, at Fulmer, Bucks, the wife of Captain Dudley Gotla, R.A.M.C.—a son.
ROBINSON.—On May 22, at Maidstone, the wife of Captain H. J. Robinson, R.A.M.C.—a son.
SPALDING.—On May 27, at Farnborough, Kent, the wife of Mr. J. E. Spalding, M.S.—a daughter.

MARRIAGES

PATON—DIMMOCK.—On May 20, at Catterick, David Paton, captain R.A.M.C., of Hamilton, to Phyllis Dimmock, of Beaconsfield.
TAYLOR—LATTER.—On May 24, at Chelsea, Arthur Gordon Taylor, L.D.S. Eng., St. Albans, to Rosalind Brackenbury Latter, M.R.C.P.
WALKER—MOYCE.—On May 27, at Wanstead, John Jeal Walker, surgeon lieutenant R.N.V.R., to Ellaline Jessie Mary Moyce.

DEATHS

BROOK.—On May 26, at Pennard, William Frederick Brook, F.R.C.S.
GUNN.—On May 4, John William Cormack Gunn, M.B. Edin., professor of pharmacology and dean of the faculty of medicine in the University of Cape Town, aged 52.
MANSELL.—On June 1, at Lambeth Hospital, London, Harry Edward Mansell, B.M. Oxfd, F.R.C.P., aged 40.
NICHOLSON.—On May 26, in Edinburgh, Harry Oliphant Nicholson, M.D. Aberd., F.R.C.P.E.
WAKEFIELD.—On May 27, at Haslemere, Thomas Wakefield, M.B. Camb., aged 90.

On the advice of their food rationing (special diets) advisory committee the Ministry of Food has decided that extra supplies of cheese will not be made available for diabetics.

In their article of May 3 Dr. Lipschütz and Dr. Vargas referred to the synthetic desoxycorticosterone acetate they used as "doca." Messrs. Ciba point out that this was supplied by their associated firm in Basle, and that Docais the trade mark of another firm. Percorten is the registered trade mark for Messrs. Ciba's desoxycorticosterone acetate.

". . . In the shadows that are deepening over Europe the lights of learning are fading one by one. The conception of knowledge as an international responsibility has vanished. The free flow of ideas across boundary lines between laboratories and universities has dried up. Everywhere the exigencies of the war have erased the possibility of intellectual and cultural life as that term was understood a few years ago . . . Over all the continental universities hangs the pall of uncertainty and fear. The contact with contemporary life has been abruptly broken. Even when fundamental research is being continued, publication has largely been abandoned or postponed. In such surroundings scholarship withers and only through heroic struggle keeps itself alive. . . . When the German Minister of Justice tells the Association of University Professors that the old ideal of objectivity was nonsense and that 'today the German university professor must ask himself one question: does my scientific work serve the welfare of National Socialism?' he is voicing a doctrine which if broadly applied spells the end of Western scientific thought. When relativity becomes 'an example of characteristically perverse Jewish theory,' and genetics is a battleground for the 'Aryan theory,' then the end of the day has come in which Claude Bernard could say: 'I give small thought to where the truth will lead me, provided that I find it'"—RAYMOND B. FOSDICK in the report of the Rockefeller Foundation for 1940, pp. 10–13.